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CHEMISTRY OF INHALATION ANESTHETICS*

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The differing experiences which expert anesthetizers have had in the use of ethyl ethers supplied by various manufacturers in numerous surgical cases have prompted the present investigation of the chemistry of inhalation anesthetics. These differences are often not to be explained by idiosyncrasy. Then, too, the standards laid down by the various pharmacopeias of the world are not uniform. In view of this fact alone, a thorough investigation seemed called for. Inquiries addressed to large consumers of the solvent in manufacturing processes adduced further need for satisfactory methods of determining the purity of ethyl ether and chloroform, and of detecting impurities introduced, or proving their absence if eliminated, in the modification of the raw products used in their manufacture. The presence of small amounts of substances has oftentimes been the cause of a chemical reaction proceeding in a particular direction by virtue of a "catalytic action." So the presence of even traces of certain substances, as for example, peroxidized compounds, aldehyd, etc., in ether, may have caused some reactions to be incorrectly explained, or to follow an unusual or unaccounted for route. This is undoubtedly true for many physiologic changes.

The investigation of ether and chloroform naturally called for an examination of nitrous oxid and oxygen. These researches have been quite thorough and pursued for several years.

NITROUS OXID[1]

In 1793 Deiman and others prepared nitrous oxid by heating ammonium nitrate, essentially the commercial process for its manufacture to-day,[2] as it is made by heating such a mixture of salts that ammonium nitrate is one of the bodies taking part in the reaction.

Commercial nitrous oxid is apt to contain these impurities: chlorin nitric and nitrous oxids, nitric acid, ammonia, hydrochloric acid, carbon dioxid, oxygen, nitrogen and the rare gases of the air. It is usually purified by passing the gas through solutions of sodium hydroxid, ferrous sulphate and sulphuric acid. Further purification may be accomplished by the formation of a hydrate below 0 C. and heating this hydrate (N_2O, $6H_2O$); by fractional condensation, and by fractional distillation (to remove the rare gases of the air), but these methods are not practiced in this country.

Table 1, which is self-explanatory, exhibits the results of our analyses of compressed nitrous oxid as supplied by American manufacturers.

TABLE 1.—ANALYSIS OF NITROUS OXID OF AMERICAN MANUFACTURE

No.	N_2O†	H_2O	CO_2	NH_3	O_2	N_2 etc., by Difference	N_2O by Explosion	N_2O by $Cu + CO_2 + H_2$‡	N_2O by $Cu + H_2$‡
1	99.7	0.13	0	0.006	•	0.16	97.5	99.4	99.7
2	96.6	0.15	0	0.001	•	3.25	95.0	96.2	96.6
3	99.5	0.15	0	0.000	•	0.35	97.3	99.5	99.5
4	95.9	0.16	•	0.000	•	3.94	94.1	95.6	95.9

* Present. † Actual percentage present. ‡ New methods of Baskerville and Stevenson.

Standards of Purity.—Nitrous oxid which is to be used for anesthesia should contain at least 95 per cent. of N_2O and no solids, liquids, combustible organic matter, chlorin, or other oxids of nitrogen. A small amount of carbon dioxid, according to the investigations of Gatch, can have no evil effects. If present, however, the percentage should be known.

ETHYL ETHER[3]

Ethyl ether is still made commercially by the historical process of treating alcohol with sulphuric acid—hence the misnomer of "sulphuric ether," or "vitriolic ether"—although other synthetic processes have been proposed, some of which have been tried out, but always without commercial success.

The quality of ethers on the market depends on, first, the purity or grade of the alcohol used; and, second, secondary reactions which take place, not only with impurities in the alcohol, but with ethyl hydroxid itself. For example, ethyl ether made from ethyl alcohol denatured by methyl alcohol contained other ethers, as dimethyl oxid or methyl-ethyl ether, not found in the ether made from rectified spirit. The generous interpretation of the denatured alcohol act by our government officials, whereby alcohol denatured by ether itself may now be used, eliminates these substances. Many of the impurities traceable not only to the quality of the raw products used, but to the secondary reactions of their virgin impurities, due to variations, as in tem-

* Read in the Symposium on Anesthesia in the Sections on Pharmacology and Therapeutics and Pathology and Physiology of the American Medical Association, at the Sixty-Third Annual Session, held at Atlantic City, June, 1912.

* Because of lack of space this article is abbreviated in THE JOURNAL. The complete article appears in the Transactions of the Section and in the author's reprints.

1. See Baskerville and Stevenson (Jour. Ind. Eng. Chem, August, 1911, No. 8) for a detailed account of the preparation, analysis and purification of nitrous oxid.

2. It is usually carried out by heating mixed salts, as $NaNO_3$ and $(NH_4)_2SO_4$, $NaNO_3$ and NH_4Cl, etc.

3. For a full consideration of the chemistry of ethyl ether see Baskerville and Hamor: Jour. Ind. Eng. Chem., 1911, iii, Nos. 5 and 6. On ethyl ether for anesthetic purposes see Baskerville: Am. Druggist, Sept. 26, 1910.

perature, pressure and other conditions, were removable and have in a large measure been removed, or much reduced, by subsequent purification.

The specific gravity of ether intended for anesthesia should not exceed 0.720 at 15 C., provided that an ether containing minimum quantities of alcohol and moisture is required; an ether, however, which shows a specific gravity of 0.7215 (2 per cent. absolute alcohol), 0.7227 (3 per cent. absolute alcohol), or even 0.724 (4 per cent. absolute alcohol), provided that the sole "impurity" is ethyl alcohol, is acceptable for anesthetic purposes according to various pharmacopeias.

Presence of Alcohol in Ether.—In this connection it may be stated that for various reasons a pure ether may be diluted with ethyl alcohol when it is to be used for anesthesia. Impurities then observed may be due in part to the alcohol used in dilution. Practically all ethyl alcohol contains some acetaldehyd.

It has been asserted that ethyl alcohol serves as a preservative for ether when the latter is properly stored, which is not true; and small amounts interfere in no way with the application of ether in anesthesia. The presence of alcohol is unnecessary except when ether is administered by the drop method. In this case the presence of alcohol prevents too rapid volatilization and consequent chilling of the apparatus with which the ether is administered; and the alcohol remaining on the cone lowers the freezing-point of the condensed moisture of the breath. The presence of excess moisture in liquid ether should be guarded against, since ether in contact with water, or moist air, in time gives rise to various impurities of an objectionable nature. Thus anesthetic ether even of proper grade may develop impurities to be avoided quite as much as if they had been introduced in the original materials or later produced in the manufacture or added in the preparation for distribution in commerce.

Assisted by W. A. Hamor, I have conducted an extensive investigation of the changes which occur in ethyl ether during storage, and the experimental data obtained lead to the conclusion that the oxidation of ether in the presence of moisture is productive of a series of complex conversions, initiated, however, by the formation of hydrogen dioxid.

Our experimental work seems to establish beyond any doubt the fact that ether of anesthetic grade contains peroxidized compounds after exposure to varying temperature conditions and sunlight, in the presence of atmospheric oxygen, for considerable periods of time, especially when it is stored in colorless glass vessels, or in badly stoppered tin containers.

Acetaldehyd, the presence of which may account for some of the observations made in practice, is one of the impurities most likely to be generated by exposing partially filled containers to varying atmospheric conditions for continued periods of time. Ether should not be stored in glass vessels for any length of time without being tested for oxidation products before use; and the tin containers should be of such capacity that they need not be opened without being emptied when the ether is employed for anesthetic purposes.

Since it is highly important that ether intended for anesthetic purposes should be carefully manufactured and properly stored, as prolonged exposure to light and air greatly affect the results of etherization, causing coughing, suffocation, and even dangerous after-effects, such ether should always be tested for acidity, peroxids and aldehyd, and the presence of the last should be rigorously guarded against; or the ether, if so contaminated, should be administered by a method which eliminates these impurities before it is introduced into the animal system.

We have made a study of the value of all proposed tests for the impurities in ethyl ether, and devised several new and superior ones. A scheme for examination has been worked out and is now available in the literature.[4]

CHLOROFORM[5]

Liebig prepared chloroform from chloral and by treating acetone with "bleaching-powder." Guthrie and also Soubeiran treated alcohol with "bleaching-powder." Schering generated his "bleach" in the presence of alcohol by electrolysis. Then "methylated spirit" was used, whereby so-called "methylated chloroform" was obtained. In 1848 Böttger and others used acetates, and then chlorin was liberated in acetone by electrolysis. This process is used extensively in this country now. Methane of natural gas has been burned in chlorin, but this process has not proved successful commercially so far. Carbon tetrachlorid, made by chlorinating carbon disulphid, is being reduced by the process of A. W. Smith to produce much chloroform in this country at present. "Chloral chloroform" is imported in small quantities.

From the variety of *Ausgangs-Material* and different methods used, it is quite evident that crude chloroform may contain a wide range of impurities, which may vary not only with the materials used, but also with the conditions of manufacture. Alcohol has been removed from chloroform by washing with water, the chloroform being subsequently dried over calcium chlorid. Potassium hydroxid has been used to remove excess chlorin and acids. Manganese dioxid has been used to remove sulphur dioxid. Chloroform has been treated with concentrated sulphuric acid until the acid was no longer colored, and then the vapors of chloroform have been passed through towers of crystallized sodium carbonate; rectification has followed. To remove special impurities or decomposition products of the chloroform itself, chloroform has been treated with lead dioxid, with potassium permanganate, or with dilute sodium thiosulphate; or it has been distilled over 2 per cent. paraffin or poppy oil.

"Chloroform Anschutz" is obtained by distilling from crystals of salicylid-chloroform ($C_{28}H_{16}O_8$, $2CHCl_3$). "Chloroform Pictet" is made by chilling chloroform to — 80 C., filtering off the solids produced, and then lowering the temperature to — 82 C. and drawing off the liquid impurities. The frozen chloroform is then fractioned, the intermediate 80 per cent. of the distillate being taken.

Specific gravity determinations are not to be regarded as criteria of purity beyond indicating the amount of alcohol in chloroform.

There has been not a little diversity of opinion among chemists as to the nature and products of the decomposition of chloroform, especially the changes which chloroform undergoes on exposure to air; in fact, this discordance dates from the introduction of chloroform as an anesthetic and prevails to-day. This condition is ascribable to the many influencing factors occasioned by the degree of purity of the chloroform under examination and the extent and nature of the exposure, but is principally due to the failure to consider and cor-

4. Baskerville and Hamor: Jour. Ind. and Eng. Chem., iii, 395.

5. The history, uses, manufacture, purification, physical constants, decomposition, impurities and examination of chloroform of all grades are treated at some length by Baskerville and Hamor in Jour. Ind. Eng. Chem., March to August, 1912.

rectly interpret the rôle of the general variable, alcohol, and with it the accompanying moisture.

The products of the decomposition of "pure" chloroform, according to various investigators, may be summarized thus:

Chlorin; hydrogen chlorid: Morson, Maisch and Hager.
Carbonyl chlorid: Rump, Regnault.
Carbonyl chlorid; hydrogen chlorid: Stark, Ramsay, Schoorl and Van den Berg, Dott.
Carbonyl chlorid; chlorin: Brown, Schacht and Biltz, and Adrian.

The formation of carbonyl chlorid alone is definitely agreed on.

The decomposition of chloroform has been universally conceded to be an oxidation process. It is generally accepted that chloroform is unaffected by light alone, and that light, although it accelerates oxidation, is not a necessary factor in the process (Hager, Rump, Brown, Schoorl and Van den Berg); several investigators, however, appear to have inclined to the view that light favors decomposition (Regnault, Dott).

With regard to the changes which occur in anesthetic chloroform during exposure to air and light there also exists a decided diversity of opinion, principally owing to the fact that no examinations were made during the course of the various investigations, so far as I am aware, for the presence of the oxidation products of alcohol in such chloroform. The whole subject required investigation, and accordingly an experimental study of the decomposition of both pure and anesthetic chloroform was carried out. It was also hoped to throw light on, if not fully explain, the rôle of alcohol[6] and other substances in the so-called preservation of chloroform, a satisfactory explanation of which has been wanting.

Various samples, twenty-three in all, both of pure chloroform[7] and of chloroform containing the usual pharmacopeial amounts of alcohol and water, were exposed in well-stoppered[8] containers of various sizes; these held varying amounts of the samples, and were of both colorless and anactinic glass, such as are customarily used in the trade. The exposures were made for different periods of time, but at room temperature, 20 C., from September to May, inside of a window having direct southern exposure. The conditions were extreme, but nevertheless were similar to those obtaining in many pharmacies and hospitals.

The anesthetic chloroform used was examined prior to the experiments, and only such chloroform as was found to be free from all impurities was used. An amount of water, however, equivalent on the average to 5.1 per cent. by volume of the alcohol present was permitted. Thus each sample was of pharmacopeial grade.

The tests applied for the detection of the oxidation products of chloroform and alcohol were those previously proved out in our work. Quantitative determinations of the impuritis developed were made whenever it was possible to do so.

6. The amounts of alcohol stated as permissible in the various official chloroforms intended for anesthetic purposes are as follows:

Belgium	1.0 per cent.
Denmark	1.0 per cent.
Sweden	0.5-1.0 per cent.
United States	0.6-1.0 per cent.
France	0.005, part by weight.
Italy	0.5 per cent.
Switzerland	1.0 per cent. absolute.

7. This chloroform was prepared according to the method of the author and was absolutely pure. Its physical constants were: boiling point, + 61.2 C. at 760 mm.; density, 1.49887 at 15.4 C.

8. No cork stoppers unprotected by metal caps were employed. In the experiments on pure chloroform glass-stoppered bottles were used solely.

RESULTS OF AUTHOR'S EXPERIMENTS WITH CHLOROFORM

The experimental results warranted the following conclusions:

1. The products of the oxidation of pure chloroform are carbonyl chlorid and hydrogen chlorid, which come about according to the reactions:

$$CHCl_3 + H_2O + O_2 = COCl_2 + HCl + H_2O_2;$$
$$CHCl_3 + H_2O_2 = COCl_2 + HCl + H_2O.$$

We are convinced that oxidation will not occur if water be excluded, and the absolute exclusion of moisture appears to be impossible in practice. Hydrogen dioxid is formed, although we were unable to detect it in the chloroform undergoing oxidation and therefore concluded that its existence is ephemeral, and oxidation of the chloroform continues throughout the period of the exposure. The rôle of the water is that of a true chemical catalyst. The decomposition of pure chloroform is accelerated by light, as was shown by a comparison of the results obtained in the experiments wherein colorless glass was used with those in which anactinic glass containers were employed. Carbonyl chlorid is formed with increased readiness in the presence of acids.

The extent of the oxidation is dependent on the nature of the container, the amount of air present, the purity of the sample, and the intensity of the light to which it is exposed. With light alone, when no air is present, no decomposition occurs for ordinary periods of exposure; and in cases where there is air contact alone and no exposure to light, the oxidation is slow.

2. The products of the oxidation of anesthetic chloroform are primarily the oxidation products of alcohol, and no decomposition of chloroform itself occurs while the oxidation of alcohol proceeds. When the oxidation of alcohol reaches a maximum, decomposition of the chloroform goes on as in the case of pure chloroform, with the exception that chlorinated derivatives of the oxidation products of alcohol may result. The decomposition of the chloroform itself is retarded, even prevented, so long as oxidation of the alcohol proceeds, and the retardation is consequently dependent on the amount of alcohol present. The extent of the oxidation is subject to the conditions referred to in the oxidation of pure chloroform. It is important to note, however, that anesthetic chloroform nearly always contains water, the usual amount being about 0.05 per cent. by volume, according to my experiences.

The preservative action of alcohol is due to the combination of the retarder with certain of the reacting substances; and any substance soluble in chloroform and readily oxidizable will exert an inhibitory effect on the oxidation of chloroform itself, for example, sulphur and many other substances. All compounds which have been found to serve as preservatives of chloroform are reducing agents, and the effect is due to their capacity for oxidation.

THE STORAGE OF ANESTHETIC CHLOROFORM

Anesthetic chloroform should preferably be furnished in vials, ampules, or bottles of high-grade anactinic glass containing about the quantity sufficient for one narcosis, and at the most not more than can be used within several days. If, for any particular reason, chloroform is ordered in a large container, it is advisable, immediately after opening it, to subdivide the entire remaining contents into 2-ounce bottles, taking care to fill the small bottles completely. It is important to see that the bottles are first completely free from water, and empty bottles should not be refilled without thorough

cleansing and drying. In no case should chloroform be gradually withdrawn in small quantities from large bottles or carboys. When it is found necessary to store anesthetic chloroform, it should always be kept in a cool, dark place, in well-filled, or, better still, completely filled, tightly stoppered bottles of anactinic glass.

The keeping qualities of anesthetic chloroform may be seriously affected by the character of the containers. The question of keeping anesthetic chloroform in tin containers has been a much agitated one in the federal War Department, and within the last ten years that department has decided in favor of the tin container.

My opinion is that glass containers are more conducive to purity for several reasons.

The impurities of anesthetic chloroform, so-called "organic impurities," are traceable to the materials used in the making, method of manufacturing, subsequent purification and manipulation before marketing, which may be grouped into Class A, and those developed with different conditions of storage, Class B.

These impurities, even though some may not be of much importance from a physiologic point of view, must still be given attention, since an impure chloroform is more likely to become altered through oxidation during storage, notwithstanding the fact that pure ethyl alcohol has been added. So far as I have been able to learn, the adulteration of anesthetic chloroform is not practiced now, and crude chloroform is no longer sold as chloroform of anesthetic grade.

In the Class A we have: excess water; excess alcohol; acetone; methyl alcohol; carbon tetrachlorid; carbon dichlorid (C_2Cl_4), carbon trichlorid (C_2Cl_6), etc.; aldehyds; amyl, propyl and butyl alcohols, and compounds; ether; acids (sulphuric, hydrochloric, formic); metallic chlorids; ethyl chlorid; ethylidene chlorid; ethylene chlorid; ethyl acetate; oils ("empyreumatic," "pyrogenous," "chlorinated"); fixed and extractive matter.

The possible impurities under the head of Class B are as follows: acetaldehyd; acetic acid; carbonyl chlorid; hydrochloric acid; hydrogen dioxid; chlorin; chlorinated derivatives of alcohol oxidation products.

A discussion of the numerous tests for these substances would of necessity involve much detail and be of interest mainly to the analytical chemist. In our laboratory we have studied every test we have been able to find in the literature and have been forced to devise new ones in some cases, while in others we are unable to make any recommendations at all as yet.

CHLOROFORM VAPOR AND OXYGEN

Among the anesthetic mixtures the combination of chloroform vapor with oxygen was used shortly after the introduction of chloroform as an anesthetic, and it has recently been reintroduced into practice. Hence it was important to investigate the changes which anesthetic chloroform underwent when a current of oxygen was conducted through it.

Experiments were carried out in order to determine whether the passage of a current of oxygen through anesthetic chloroform brought about decomposition of the anesthetic. Anesthetic chloroforms containing 0.56 to 1 per cent. of alcohol and 0.03 to 0.05 per cent. water were used. The conditions were such, except that the temperature was about 20 C., as obtain during administration by the Gwathmey method, his apparatus being used. The oxygen was allowed to flow at such rates through 3½ to 4 ounces of the anesthetic that about one-half remained in the vaporizer after three and one-half to ten and one-half hours. In one experiment the chloroform vapor was passed through water, as is Dr. Gwathmey's practice, and subsequently condensed. The examination of the residue and condensed chloroform showed the following:

Acidity (acetic acid):

Chloroform used	None.
Residue in container	0.00015 gm. in 100 c.c.
Condensed chloroform	None.

Sulphuric acid test:

Chloroform used	Negative.
Residue in container	Marked reaction.
Condensed chloroform	Negative.

Therefore it is to be concluded that the oxidation products of alcohol are not carried over when the chloroform-oxygen stream is conducted through water, and that these are concentrated in the residue. By this method of administration the patient is protected from the objectionable decomposition products, even if they have developed.

OXYGEN[12]

At the present time there are the following commercial methods for the preparation of oxygen used in anesthesia: (1) heating chlorates with or without the addition of various substances; (2) reaction of peroxids (oxone) with water and aqueous solutions; (3) by electrolysis of water; (4) from liquid air.

Oxygen that is to be used in anesthesia should contain at least 95 per cent. oxygen on the dry basis. We found the pyrogallate method for the determination of oxygen the most convenient to employ and most satisfactory provided Hempel's precautions to prevent the production of carbon monoxid are taken.

Analyses, by our methods, of oxygen on the American market gave the results shown in Table 6.

TABLE 6.—ANALYSIS OF OXYGEN ON THE AMERICAN MARKET

No.	Source of Oxygen	O_2	H_2O	CO_2	H_2	Organic Matter	N_2 etc.	All Other Impurities
1	$KClO_3 + MnO_2$	93.20	0.30	0.11	0.00	0	6.39	0
2	$KClO_3 + MnO_2$	98.31	0.14	*	0.00	0	1.54	0
3	$KClO_3 + MnO_2$	92.82	0.26	†	0.00	0	6.92	0
4	$KClO_3 + MnO_2$	97.13	0.23	*	0.00	†	2.63	0
5	Liquid air	96.10	0.15	0.01	0.00	0	3.74	0
6	Electrolysis	99.23	0.35	0.03	0.14	0	0.25	0
7	$Na_2O_2 + H_2O$	99.20	0.50	†	0.00	0	0.30	0

* Present. † Trace.

CONCLUSIONS

I realize the danger of a mere chemist making an excursion into the domain of medicine, but the extremely venturesome one, if he has luck, may avoid the pitfalls of which he is supposed to have little knowledge. I have done enough in this field to justify certain conclusions concerning the administration of anesthetics.

Modern studies in physiology have unquestionably shown that the animal body exists to a great extent by virtue of the chemical and physical changes going on within it. I know of no valid reason for assuming that these changes are essentially different from those we control in the laboratory. If we wish to duplicate or control a physical or chemical change in the laboratory, we must become familiar with all the factors and conditions. I know of only one class of such changes over

12. The preparation and analysis of commercial oxygen are discussed by Baskerville and Stevenson in Jour. Ind. Eng. Chem., 1911, iii, No. 7.

which we have not as yet secured control, and in that class belong those processes which we term radio-active. I am not sure but that we even have indications pointing toward our control of these. One of the essential factors in controlling a chemical process is the quality of the material with which we are working. I cannot therefore but regard all published statistics as to the mortality attributed directly to the anesthetic used as more or less worthless and that a large number of new cases must be observed to secure knowledge of the real physiologic effect of the drug when carried into the system by the pulmonary route.

Idiosyncrasy has served to account in large part for untoward after-effects of anesthetics and certain disagreeable consequences, as nausea, and interference with some of the normal organic functions, as glycosuria and albuminuria; these have often been regarded as natural results of anesthesia and taken for granted. They may now largely be obviated, and in many cases entirely avoided, by the use of anesthetics that are free from impurities, and by improved methods of administration. These statements are based on clinical evidence.

The main objectionable constituent in ether is acetaldehyd. American official ethers call for from 3 to 4 per cent. of ethyl alcohol in accordance with an old theory. Alcohol is practically never free from water, and in the presence of water and oxygen forms oxidation products. The speeds of the changes depend on conditions. It has been shown that the administration of moist ether, free from aldehyd, at body temperature, is rarely followed by nausea (in less than 10 per cent. of cases) and the usual strain on the kidneys is not so great. The last, however, according to the investigations of Hawk, are largely dependent on the preanesthetic diet.

Chloroform was formerly made mainly from alcohol, and contained many of the normal impurities of the alcohol used. These were not removed by the methods of purification practiced, nor are they removable now, except by elaborate methods of purification. These impurities doubtless have had much to do with the feeling of uncertainty in administering chloroform. Pure chloroform undergoes decomposition when exposed under certain conditions, such, for example, as the manner in which anesthetic chloroform is dispensed in some drug-stores and hospitals. A suitable amount of alcohol prevents this decomposition, shifting the change in composition to itself; hence anesthetic chloroform should contain ethyl alcohol. But the conditions of transportation and keeping of this chloroform should be such as to reduce the change of alcohol to aldehyd and acetic acid to the minimum.

Nitrous oxid, ether and chloroform exert each its specific physiologic effect in producing anesthesia without asphyxiation, provided the respiratory and cardiac functions are maintained approximately normal. This may be accomplished by administering these drugs with sufficient oxygen not to interfere seriously with the normal function of the hemoglobin of carrying oxygen to the capillaries, and by maintaining the usual concentration of carbon dioxid in the blood, and providing its regular elimination. Other factors involved are temperature and moisture. The anesthetics are carried into the system at body temperature. This may be accomplished by warming, and in the case of ether and chloroform by passing the vapor through heated water which, at body temperature, not only removes the aldehyd, but saturates the gas with moisture (Gwathmey method). Bruning[13] has concluded that too much moisture is as injurious as too little. Davis heats the anesthetic vapor after washing, whereby the "humidity" is reduced, so that the vapor enters the lungs as moist as normal air. The osmotic action of the alveolar cells is thus affected only to the extent of the densities of the gases introduced into the lungs and not, as normally is the case, by temperature (always lower) and desiccation as well. In other words, by the application of the principles of modern physical chemistry, the numerous variables are so reduced as to secure the real physiologic effect of the particular anesthetic drug after it enters the system. The real, and no conjectural, idiosyncrasy of the patient may be met. Here the physiologic chemist must take up the task; and it needs to be taken up.

SPINAL ANESTHESIA *

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In previous writings on this subject,[1] I reported 242 of my own cases, done at the Massachusetts General Hospital and in private practice, with a minimum of untoward effects during and after anesthesia, but with fifteen partial or complete failures to produce anesthesia, and with one case which showed very alarming symptoms during and after operation with eventual perfect recovery. I have now to report of my own cases, only an additional thirty-three. These, combined with twenty-nine cases (two failures) done by Dr. G. W. Morse, and sixteen cases (two failures) done by Dr. G. D. Cutler, the resident surgeons of the Massachusetts General Hospital, make a total of three hundred and twenty cases with nineteen failures.

Since my last report I have had no failures, have been able to perform spinal puncture almost without pain, and have had no untoward effects during operation, and a minimum of untoward effects after operation. This is due to increased skill and refinement of technic. I have also had many striking cases illustrating the great value of this wonderful method.

Though I have had no deaths, I am aware that 320 is a small number of cases from which to draw conclusions as to the safety of a method. I shall therefore make no effort to arrive at any statistical conclusion as to its safety, but will repeat my previous statement, that reviewing the work of Tuffier, Bier,[2] Dönitz,[3] Jonnesco,[4] Ryall,[5] McGavin and O'Leary[6] and others whose writings or work I have studied, and considering the freedom from untoward effects of our own cases, I am firmly of the opinion that this method is not only of inestimable value, but is, in competent hands, and carrying out rigidly a correct technic, a perfectly safe method, com-

13. Bruning: Deutsch. Ztschr. f. Chir., 1912, cxiii, No. 6.

* Read in the Symposium on Anesthesia in the Sections on Pharmacology and Therapeutics and Pathology and Physiology of the American Medical Association, at the Sixty-Third Annual Session, held at Atlantic City, June, 1912.

1. Allen: Spinal Anesthesia, Boston Med. and Surg. Jour., clxii, No. 19; Remarks on Local, Spinal and Central Anesthesia, read at the annual meeting of Massachusetts Medical Society, June 13, 1911, Communications of Mass. Med. Soc., 1911, xxii; A Review of Ten Years' Work in Anesthesia, Boston Med. and Surg. Jour., clxv, No. 26, p. 976.
2. Bier: Deutsch. Ztschr. f. Chir., 1908, xcv, 373.
3. Dönitz: München. med. Wchnschr., 1908, lv, 1698.
4. Jonnesco: Brit. Med. Jour., 1909, ii, 1396.
5. Ryall, E. C.: Practitioner, London, 1911, lxxxvii, 393.
6. McGavin: Brit. Med. Jour., 1910, ii, 733; McGavin and O'Leary: Practitioner, London, 1912, lxxxviii, 406.

paring more than favorably with the more modern methods of producing general anesthesia such as gas and oxygen anesthesia or the administration of ether by the rectal, intravenous or intratracheal method.

WHY SPINAL ANESTHESIA IS NOT MORE OFTEN USED

Assuming that this opinion may have some weight, let me inquire into the reasons why spinal anesthesia, if it really is a safe and successful method, is so little used and is so generally frowned on and discredited by the great majority of surgeons.

As I stated in a previous paper, the principal reason for this is the large mortality shown by this method during the days of its incipiency, when cocain was used and when the imperative necessity was not appreciated of using epinephrin as an adjunct to whatever anesthetizing drug is to be injected into the spinal canal.

Now that the method, through the work of Bier and Dönitz, has been put on a safe basis by abolishing the use of cocain and by using stovain, novocain or tropacocain in combination with epinephrin, it is still difficult for many of us to eradicate from our minds the profound impression of danger produced by the early mortality. I remember when I considered spinal anesthesia an absurdly dangerous method; I now consider it a remarkably safe one.

Another and very potent reason for the unpopularity of spinal anesthesia is to be found in the fact that most surgeons, not realizing that its proper administration requires special instruction and experience, believe that by reading how to do spinal puncture they can equip themselves with any needle that is long enough, prepare their own anesthetizing drug, inject it into the spinal canal with an indifferent syringe and obtain a perfect result.

Such results as the breaking off of steel[7] needles in the lumbar spine, the patient's complaints of the pain caused by the puncture and finally the failure to produce anesthesia cause the surgeon to think, not that he is incompetent to administer it properly, but that the method is "unreliable, dangerous and no good anyway," and he promptly condemns and gives it up.

A visit to Bier's clinic in Berlin, and possibly the investing of a few marks in taking a course in local and spinal anesthesia under one of Bier's assistants, would probably convince any surgeon that he had something to learn about both these methods, and that reading alone is not sufficient preparation to qualify a man, however skilful he may be, to administer spinal anesthesia successfully. A great deal of practice and careful attention to many seemingly insignificant details are essential to this end, besides having a proper equipment of drugs, syringes and trochars. All this I have described in detail in previous writings and shall therefore discuss only in a general way the advantages of this method in certain operations especially with a view to combating shock, and shall analyze, as far as time allows, my new cases and the lessons I have learned from them.

ADVANTAGES OF SPINAL ANESTHESIA

The life-saving possibilities of the method are shown to the best advantage in cases in which shock and sepsis have to be dealt with, as, for example, cases of intestinal obstruction with fecal vomiting, beginning peritonitis following appendicitis and amputations for accidents, such as railroad crushings and compound fractures. The method gives such patients the best possible chance for life. Equally wonderful are its results in prostatectomy in old men, amputation for diabetes or senile gangrene, chronic intestinal obstruction, Kraske's operation for extirpation of the rectum, operation in which general anesthesia—even that of gas and oxygen, unless Crile's full "anoci-association" method be employed—materially increases the shock. Ryall administers spinal anesthesia as a routine in any operation in which shock plays a part, supplementing the spinal puncture if necessary by inhalation anesthesia.

It absolutely blocks the transmission of impulses from the periphery to the brain and thus entirely eliminates shock. Its use in certain operations would largely do away with the necessity for using novocain and quinin and urea locally as Dr. Crile does in his admirable "anoci-association" work, and would in any event be a valuable adjunct to "anoci-association."

Besides the inestimable value of the method in the above operations I am so strongly impressed by its results in certain of the commoner operations that I am hoping to have it used at the Massachusetts General Hospital eventually as the routine method in all cases of hernia, fistula *in ano*, hemorrhoids, varicose veins, hydrocele and varicocele, etc. Although entirely overlooked at present by the orthopedic men in our city, it would be particularly useful and safe in this branch of work, in any operation below the umbilicus—particularly so because in these cases it would not be necessary to produce a very high or a very intense anesthesia.

Although I have never tried Jonnesco's method of puncturing in the cervical region for operations on the head, neck and upper extremities, I am hoping to do so in the near future, and am confident that the method could be made useful and safe when so used.

AUTHOR'S EXPERIENCE

There are certain useful lessons as to technic and the care of patients that I have learned from my more recent cases. To begin with, as I said before, I have had no failures in my last thirty-three cases. Failures are always due to errors in technic, the commonest error being to let the point of the trochar slip out of the spinal canal at the time of injection. Once having obtained a satisfactory flow of fluid, just before making the injection I always make sure that the flow is still continuing by detaching the syringe from the trochar and then holding the latter immobile by placing the side of the left hand against the patient's back and steadying the butt of the trochar with the thumb and forefinger, at the time of making the injection. If this precaution is neglected, the point of the trochar can easily slip out of the spinal canal when the syringe is being attached. If injection is made at this time, failure will of course result, as the drug will not enter the spinal canal.

I have also learned lately how to make the injection absolutely painless, or at least as painless as an ordinary hypodermic injection. This is done by first thoroughly freezing the skin with ethyl chlorid and then piercing the skin itself by a quick thrust with a reasonably sharp trochar. Patients, when questioned as to the relative pain of the hypodermic injection and the spinal puncture, will almost invariably pronounce the former the more painful. As pointed out by Dr. Lusk,[8] however, the trochar must not be too pointed on account of the danger of impaling nerve-trunks on it.

7. Steel needles should never be used. Platinum or nickel is the metal to employ.

8. Lusk: Ann. Surg., lv.

I have given up for the present the use of stovain and novocain and use invariably a 5 per cent. tropacocain hydrochlorid solution with epinephrin, prepared after Dönitz' formula.[9] This is much less toxic than the other two drugs, although it does not produce quite so intense an anesthesia as stovain.

I have entirely abandoned the use of the Trendelenburg position, except in cases in which a particularly high anesthesia is desired. The use of this position for more than a minute or two after injection is very apt to produce toxic symptoms, i. e., nausea, vomiting, sweating, etc., from the anesthetizing drug getting too high in the spinal canal. In ordinary cases a sufficiently high anesthesia can be obtained by slightly increasing the force of the injection. My highest anesthesia was in a case of subacute intestinal obstruction, and extended 1 inch above the nipples. After an interval of fifteen or twenty minutes the Trendelenburg position seems to be safe, probably because most of the drug has begun to be absorbed by that time. In perineal and suprapubic prostatectomy the Trendelenburg posture is rarely required before this time, which removes the objection made by some operators that spinal anesthesia is not applicable to prostatectomy because the Trendelenburg posture must be barred.

Toxic symptoms such as faintness, nausea, vomiting, sweating, air-hunger, feeble pulse, pallor, etc., should be met by elevating the head and shoulders, injecting strychnin, giving a stiff drink of brandy or whisky by mouth (if nausea has not begun), massaging the face and lips with hot cloths and by disturbing the patient as little as possible by questioning and noise in the room.

It is important not to allow patients who are to have spinal anesthesia come to operation starved and faint. They should be given a light breakfast on the morning of the operating-day and possibly an egg-nog just before operation. In the case of a man of 63 years undergoing a Kraske operation for extirpation of the rectum, I gave by mouth, on the table at the end of one hour and a half's operating (the whole operation lasted two hours and a quarter), two tumblerfuls of hot soup and several crackers. These were eaten with great relish by the patient, who went through the operation with no shock whatever.

It is important to remember that owing to the complete paralysis of the sphincters nothing will be retained by rectum for two or three hours following operation.

It is equally obvious and important that special precautions should be taken against hot-water bottle burns about the lower extremities.

PSYCHIC ASPECT OF SPINAL ANESTHESIA

The psychic aspect of spinal anesthesia is interesting from the point of view of the anesthetist, of the surgeon and of the patient. In the course of my daily work I see an enormous amount of all kinds of surgery done both in hospital and in private practice. It is therefore natural that I should come to classify patients into certain group or classes, some suitable to one form of anesthesia, some to another. What strikes me most forcibly is the enormous proportion of operations which I am positive could be safely and successfully done under spinal anesthesia with the maximum of comfort and convenience to both patient and surgeon were it not for the existing prejudice against the method. It is not the surgeons themselves who are best qualified to judge the value of an anesthetic method, except as it concerns their own work during the operation. It is their assistants and the nurses who watch the recovery of the patients from anesthesia who are the real judges. When these nurses and assistants see patients coming back from the operating-room in as good condition as they went into it, and see them immediately begin to take nourishment by mouth as they do after spinal anesthesia, they cannot help making comparisons between this and other forms of anesthesia. Thus we find that at the Massachusetts General Hospital the most active promoters of spinal anesthesia are the patients themselves whose fellow-patients see the wonderful results of the method, and secondly the house pupils and the nurses. It is very common for patients who have once been operated on under spinal anesthesia to make it a condition of their second operation that the method be used again, and the steadily increasing use of the method at our hospital at present is largely due to the house pupils who, having had opportunity to contrast it with other forms of anesthesia, are always urging its use whenever possible. It is not possible for anybody to see a considerable number of cases and not become convinced that spinal anesthesia is of the utmost value, and has a future equal to that of gas and oxygen anesthesia, if not greater.

As I have pointed out before, the importance of maintaining a proper mental attitude in the patients cannot be overestimated. They should always receive a quieting dose of morphin or some other narcotic before coming to operation and should be encouraged and reassured as much as possible by the surgeon and his assistants. If spinal anesthesia is decided on, the best results are obtained by simply telling the patient that the method is the best one for his case and its advantages explained. It is a great mistake to consult the patient as to his preferences, as this shows at once the surgeon's lack of faith in the method and produces doubt in the patient's mind. The selection of the anesthetic should not be put up to the patient in any way, beyond saying, for example, that in his case spinal anesthesia is the first choice for safety, gas and oxygen second, and gas and ether third. The patients that do the very best are those who are simply taken from the ward to the operating-room, put on the table, injected and operated on with as few words as possible. They often believe the spinal puncture to be another hypodermic injection and seldom know when the operation has begun.

During operation the demeanor of the surgeon and his assistants should be in accordance with the fact that the patient is not under a general anesthetic but is keenly conscious of what is going on. As a rule the company in an operating-room who are not used to operating under spinal anesthesia will either act exactly as if the patient were deeply under ether, or else will maintain a death-like and ominous silence, speaking only in "sick-room whispers." Neither of these methods is calculated to put the patient in the best frame of mind. The best plan is to act as naturally as possible, assuming that the patient is all right, and not disturbing him with questions as to his sensations or lack of them. If the patient is nervous or in a communicative mood it is a good plan to detail some agreeable nurse or assistant to sit by and act as mental anesthetist. But in most cases the patient appreciates being left alone and will often go to sleep during the operation.

200 Beacon Street.

9. According to Dönitz' formula "each vial (of alkali-free glass) contains 1.3 c.c. of a 5 per cent. solution of tropacocain with the addition of 0.00013 suprarenalin hydrochlorid per cubic centimeter."

AMERICAN STATISTICS *

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Many factors enter into the administration of anesthetics now that have not heretofore been considered, such as moisture, heat and oxygen. For this reason figures relating to anesthetics as given in former years have less value to us at this time than if we were continuing the methods previously employed. Nevertheless, it would be foolish for us to go blindly forward without taking into consideration statistics collated by others in different countries and making an intelligent comparison therefrom.

EUROPEAN STATISTICS

Hewitt, unquestionably, has collected the largest number of statistics. Before taking up the question of American statistics, therefore, it might be well to examine these. By combining Julliard's statistics with those of Ormsby, Hewitt gets over 1,000,000 administrations, with a death-rate of one in 3,162 for chloroform and one in 16,302 for ether. According to these figures ether is more than five times as safe as chloroform. At St. Bartholomew's Hospital, London, during the years of 1875 and 1900, there were 80,255 administrations of chloroform, ether and "gas-ether," showing a fatality of one in 1,300 for chloroform and one in 9,319 for ether and "gas-ether." Hewitt considers these the most reliable figures at his disposal, and makes the deduction that ether is about seven times as safe as chloroform and that the ratio of seven to one corresponds to that obtained by Waller as the expression of the relative toxicity of chloroform and ether. If we gather statistics according to climate, they present an entirely different aspect. For instance, Dastre[1] reports one death in 11,448 administrations of chloroform during the Crimean War, and Lawrie[2] reports 30,000 chloroform anesthetizations without a death.

It will thus be seen that chloroform, when given under favorable circumstances, is a close second to ether, if it does not equal it, in regard to safety. If we administer the chloroform with oxygen in a southern climate, the probability is that we would have an anesthetic practically free from danger. In the southern states, chloroform would immediately rise in value as regards life. We may also state that in the northern states chloroform is safer in the summer than in the winter.

I do not wish to be placed in the position of an advocate for chloroform, yet Hewitt's statistics may leave a wrong impression as to chloroform for the simple reason that they do not include facts gathered within the last few years, such as the administration of oxygen with chloroform, and chloroform heated to the temperature of the blood. Nor do they include the statistics of chloroform when administred by the Roth-Drager apparatus, in which oxygen and rebreathing are used. These statistics are fair or rather of practical value if we continue to use chloroform as in the past.

AMERICAN STATISTICS

We are now in a position to discuss the statistics gathered in the United States. About March 1 of this year I sent out 1,400 circulars to all the public hospitals with not less than ten beds in the United States, Canada, Cuba and the Canal Zone. Only 201 hospitals (14 per cent.) responded, 102 of these stating that they had no statistics to give and the other ninety-nine (7 per cent.) furnishing the statistics on which this paper is based.

Very few of the larger hospitals responded. In New York City only two large hospitals had any statistics available from an anesthetic standpoint. In all of these hospitals the statistics were obtainable provided I would pay for the compilation. In one hospital I attempted this method. The net result of my efforts was 900 administrations with a cost to me of $11 for clerk-hire. At this rate, the cost of obtaining 100,000 administrations would have been far beyond my means, so I decided not to attempt the collection of statistics from these hospitals.

TABLE 1.—THE UNITED STATES NAVY FOR THE YEARS 1908-1910

Anesthetic	Number	Deaths
Ether	2,218	2
Ether (rectal)	2	..
Ether, morphin and scopolamin	40	..
Ether and nitrous oxid	140	..
Ether and chloroform	2	..
Ethyl chlorid (general)	16	..
Ethyl chlorid and ether	24	..
Ethyl chlorid and chloroform	2	..
Chloroform	365	..
Cocain	91	..
Cocain and ethyl chlorid (local)	3	..
Cocain and epinephrin	3	..
Beta-cocain and epinephrin	4	..
Eucain	1	..
Novocain	4	..
Novocain and epinephrin	4	..
Schleich's solution No. 2	2	..
Total	2,921	2

TABLE 2.—ANESTHETICS USED IN SURGICAL OPERATIONS PERFORMED ON OFFICERS AND ENLISTED MEN OF THE ARMY FOR THE YEARS 1904-1910

Year	Chloroform No.	Ether No.	Chloroform and Ether No.	Spinal No.*	Local No.
1904	835	878	..	..	1,096
1905	713	806	83	60	1,070
1906	684	861	73	..	1,234
1907	571	831	87	29	1,270
1908	497	965	67	9	1,652
1909	335	1,326	100	..	1,873
1910	296	1,513	55	..	1,793
Total	3,931	7,180	415	98	9,988

* The agents used in spinal analgesia were tropacocain and eucain beta. Four deaths were due to the anesthetic (chloroform in all the cases).

Writing as an individual and without official authority from any source it is surprising that I received as many replies as I did. Replies were received from the Army and Navy by return mail, showing that those statistics were kept on file for inspection as are other statistics. They are inserted separately for this reason. (Tables 1 and 2.) A careful study of these statistics will amply repay one.

Table 3 shows the result of the first effort to gather American statistics concerning anesthesia. The anesthetics are placed according to their value as regards life. The number to the left of each anesthetic refers to the relative frequency of their administration. Replies were received from forty states, including Canada and the Canal Zone. The Philippines replied, but sent no statistics.

* Read in the Symposium on Anesthesia in the Sections on Pharmacology and Therapeutics and Pathology and Physiology of the American Medical Association, at the Sixty-Third Annual Session, held at Atlantic City, June, 1912.

1. Dastre: Les Anesthésiques, p. 115.
2. Lawrie: Bull. Johns Hopkins Hosp., January, 1895.

FATALITIES

Of the eight chloroform fatalities, four came from the United States Army, one from McAlester, Okla., one from Chicago, one from Minneapolis and one from Montreal, Canada.

The ether fatalities came from the following states and localities:

New York City	Ancon, Canal Zone
Pennsylvania	Buffalo, N. Y.
Poughkeepsie, N. Y.	Boise, Idaho
Ottawa, Ill.	Fall River, Mass.
Omaha, Neb.	Jersey City, N. J.
St. Louis, Mo.	Massachusetts
Raleigh, N. C.	Mississippi
South Bethlehem, Pa.	Montreal, Canada

and two from the United States Navy.

The location of the four chloroform fatalities in the United States Army is unknown. The other four, as will be seen, all occurred in a northern climate. A study of the location of the ether fatalities does not convey any special information.

The statistics received from ninety-nine hospitals include the statistics received from the United States Army and Navy. The total number of administrations from the ninety-nine hospitals was 278,945.

Of this number 157,453 were ether administrations, with a total of twenty-eight deaths, which gives a mortality of one death in 5,623. An examination of the table shows that the use of the drop method of ether is rapidly on the increase, rising from 7,523 administrations in 1905 to 53,981 administrations in 1911.

The nitrous oxid-ether sequence comes next in point of numbers, totaling 41,435 administrations, with six deaths, making an average of one death in 6,905 administrations. From these statistics the nitrous oxid-ether sequence is safer than ether by the drop or vapor method.

The next and most popular anesthetic, from a numerical point of view, is chloroform, given by the drop or vapor method, 16,390 administrations, with eight deaths being recorded, making a mortality of one death in 2,048 administrations. An examination of the table shows that the administration of chloroform is rapidly decreasing. In 1905 there were 3,048 administrations, while in 1911 there were 1,924.

The chloroform and ether statistics prove very conclusively that clinical experience and practice are in harmony with the laboratory findings in regard to these two drugs, and that the profession generally has anticipated the suggestions of the Committee on Anesthesia[3] of the American Medical Association of 1912. Chloroform is approximately two and one half times as dangerous as the nitrous oxid-ether sequence as administered in our hospitals to-day.

The chloroform-ether sequence comes next in point of numbers, giving 16,054 administrations, with two deaths, or one death in 8,027 administrations. According to these statistics, therefore, the chloroform-ether sequence is safer than the nitrous oxid-ether sequence or ether by the drop method.

Statistics concerning local anesthesia come next, with a total of 14,878 administrations with no deaths. It is safe to presume that very few of these were for capital operations.

Nitrous oxid with oxygen has 8,585 administrations, with no deaths; ethyl chlorid-ether sequence, 4,331 administrations, with one death; nitrous oxid alone, 1,314 administrations, with two deaths; ethyl chlorid 905 administrations, with no deaths. There are 516 cases of rectal anesthesia reported, with one death. In 521 spinal analgesias reported there were no deaths. Nitrous oxid with air was administered 561 times with no deaths. The nitrous oxid-ether-chloroform sequence has 183 administrations, with one death.

From this last statement it may be concluded that the nitrous oxid-ether-chloroform sequence is a dangerous one in the hands of the inexperienced. It may be stated in passing, however, that Hewitt, Buxton and other leading anesthetists of Europe, as well as many professional anesthetists in the United States, constantly use this sequence with nothing but favorable results.

When a patient is in profound surgical ether anesthesia, unless the change to chloroform is made very gradually, the anesthetist being careful to observe all

TABLE 3.—AMERICAN STATISTICS

Anesthetic	1905	1906	1907	1908	1909	1910	1911	Total	Deaths	Percentage
5. Local anesthesia	1,422	1,882	1,881	2,462	2,458	2,611	2,092	14,878	0	0-14,878
6. N_2O with oxygen	144	175	335	881	1,619	2,130	3,301	8,585	0	0- 8,585
10. Anesthol-ether anesthesia	152	406	435	584	559	772	919	3,827	0	0- 3,827
13. Ethyl chlorid, drop sp.	67	102	133	97	115	136	255	905	0	0- 905
14. N_2O with air	51	90	.....	40	90	.....	290	561	0	0- 561
15. Spinal analgesia	66	43	86	64	34	63	165	521	0	0- 521
18. Anesthol-ether-$CHCl_3$	.....	17	52	27	18	39	.....	153	0	0- 153
19. Anesthol-chloroform	.....	.....	.....	67	28	28	.....	123	0	0- 123
20. Nitrous oxid, ether-anesthol	.....	.....	75	16	14	9	.....	114	0	0- 114
21. Essence orange-ether seq.	.....	.....	.....	.....	.....	.....	100	100	0	0- 100
22. $A_1C_2E_2$ or C_2E_2 mixture	2	2	.....	.....	.....	6	85	95	0	0- 95
23. Ether-$CHCl_3$ sequence	3	18	10	1	15	13	34	94	0	0 94
24. Nitrous oxid-anesthol	.....	32	8	.....	3	2	.....	45	0	0- 45
25. Ethyl chlorid-anesthol	.....	25	2	.....	.....	14	.....	41	0	0 41
26. Anesthol-oxygen	15	.....	16	.....	.....	4	2	37	0	0- 37
27. Ethyl bromid anesthesia	12	8	.....	.....	.....	.....	.....	20	0	0- 20
28. Ethyl chlorid-oxygen	.....	.....	.....	.....	1	2	10	13	0	0- 13
29. M-H-C anesthesia	.....	.....	9	.....	.....	.....	.....	9	0	0- 9
4. Chloroform-ether sequence	756	1,374	1,770	1,641	3,022	3,804	3,687	16,054	2	1- 8,027
2. Nitrous oxid-ether sequence	2,359	2,576	4,147	4,991	11,274	6,703	9,385	41,435	6	1- 6,905
7. Anesthol	1,132	880	956	1,271	782	648	470	6,139	1	1- 6,139
1. Ether, drop or vapor	7,523	12,279	15,154	19,322	23,040	26,145	53,981	157,453	28	1- 5,623
8. Ethyl-chlorid-ether sequence	199	169	467	477	872	1,135	1,012	4,331	1	1- 4,331
9. $CHCl_3$-oxygen	401	472	664	673	461	660	678	4,009	1	1- 4,009
3. $CHCl_3$, drop or vapor	3,048	2,557	2,532	2,339	1,910	2,080	1,924	16,390	8	1- 2,048
11. Nitrous oxid	111	84	203	216	198	206	296	1,314	2	1- 657
16. Rectal anesthesia	.....	.....	.....	60	129	152	175	516	1	1- 516
12. Intratracheal insufflation	.....	.....	.....	.....	.....	.....	1,000	1,000	4	1- 250
17. N_2O-ether-chloroform anesthesia	4	.....	.....	7	12	20	140	183	1	1- 183
								278,945		

When a patient is in profound surgical ether anesthesia, unless the change to chloroform is made very gradually, the anesthetist being careful to observe all

3. THE JOURNAL A. M. A., June 15, 1912, p. 1908.

the physical signs, it is a very easy matter to plunge the patient into the fourth stage or danger zone of anesthesia.

On the contrary, when a patient has had a preliminary medication of morphin and atropin, and anesthesia is initiated with chloroform, drop by drop, and continued until the excitement stage is passed, a switch being then made to ether by the open drop method, there is very little danger of plunging the patient into the danger zone, and it is a comparatively easy matter to maintain an even plane after anesthesia is induced in the manner outlined.

Anesthol[4] was used 6,139 times, with one death, showing that the immediate results of the administration of this drug by the drop method as compared to ether is much safer. A study of the statistics shows that the administration of anesthol, continuously, has decreased from 1,132 administrations in 1905 to 470 administrations in 1911. The anesthol-ether sequence has increased from 152 administrations in 1905 to 919 administrations in 1911, with a total of 3,827 administrations, with no deaths, showing that anesthol is taking its rightful place in surgery as a preliminary to ether.

It is unnecessary to state that statistics of 1,000 administrations or less of any anesthetic, sequence or combination are valueless unless all the conditions and circumstances of the administration are known. The above statistics are more valuable for self-evident reasons than those presented by some one individual or some one hospital. Only two items appear in these statistics from individuals. One is the essence of orange-ether sequence given by Dr. Woolsey of Brooklyn, and the other is the intratracheal insufflation given by Dr. Elsberg of Mt. Sinai Hospital, New York City.

INDIVIDUAL STATISTICS

The essence of orange-ether sequence is included in order to call attention to an important discovery, namely, administration by the closed method of a non-anesthetic agent followed by ether, in which an absolutely safe anesthesia is produced while abolishing the second stage of excitement entirely, the resulting anesthesia being sufficiently deep for all surgical work requiring absolute relaxation.

Intratracheal insufflation is given a place to call attention to what is now considered by those whose judgment is impartial as an absolutely safe procedure, the four deaths under this method being entirely avoidable and not apt to be repeated.

The fact that 59 per cent. of the hospitals give preliminary medication is also in line with the suggestion of the Anesthetic Committee of the American Medical Association for 1912.

This statistical report should be considered merely and only in the form of a preliminary statement. If the surgeons connected with the larger hospitals throughout the United States would cooperate with individual statisticians, we could easily get data that would be of more value than any European statistics, and which would also urge us to great efficiency. It may be said in passing, however, that the data given by the ninety-nine hopsitals, from which replies to my request for information were received, may be considered as fairly representative of statistics from American hospitals in general.

4. Anesthol as described by Dr. Meyer in THE JOURNAL A. M. A., Feb. 28, 1903, p. 556, is a clear, transparent fluid of very agreeable odor. It has a specific gravity of 1.045 and a boiling point at 104 F. It is a chemical combination of ethyl chlorid, chloroform and ether.

EUROPEAN AND AMERICAN STATISTICS COMPARED

The fact that our statistics do not compare favorably with those of Hewitt can be easily accounted for. Every hospital in Europe has attached to its staff one or more professional anesthetists, who not only give a number of pay and free anesthetics, but who also instruct interns. This would account for the difference in the ether and chloroform mortality of American and European statistics.

The fact that chloroform is much safer and that ether is three times as safe in Europe as in America, according to the available statistics, is certainly not creditable to us. The statistics of both Europe and America are somewhat misleading from the fact that late deaths from ether pneumonia or fatty degeneration of organs following a long chloroform administration are probably not included in any of the tables. The fact, however, that there is only one death in 5,623 administrations would seem to indicate that a death could occur under ether only from gross carelessness or ignorance. We may state that no anesthetic death is possible to-day except from experimenting on new lines, or from carelessness or ignorance.

I wish to make the following suggestions:

1. The American Medical Association should appropriate sufficient money to continue the collection of these statistics from year to year.

2. In full harmony with the report of the Committee on Anesthesia just published, and from a careful study of the accompanying table, I would recommend that those using the drop method of ether should improve their technic and statistics by:

A. A preliminary medication of morphin and atropin or some similar drug or combination.

B. Commencing the anesthesia with two to four drops of essence of orange (25 per cent., U. S. P.).

C. The drop method of anesthol until the patient reaches surgical anesthesia, and then a change to the drop method of ether.

D. Replacing the drop method of anesthesia by some form of "vapor anesthesia."

The term "vapor anesthesia" means the administration of any anesthetic by passing air or oxygen over or through the anesthetic used. This insures a definite percentage and a continuous anesthesia, with a minimum amount of the anesthetic. A crude way of testing the vapor method of anesthesia can be made by placing ether in the ordinary wash-bottle that accompanies the oxygen tanks used in most of our hospitals (the oxygen not being under high pressure), a tube from the wash-bottle to be placed directly under the ether mask, which is then covered with towels. This recommendation is made because, judging from statistics, this method would be safer and more satisfactory than the "straight" use of ether as practiced in some of our leading clinics.

Finally, I wish to express my thanks to the hospitals and to the individuals connected therewith, without whose assistance it would have been impossible to have completed this collection. From the 1,000 hospitals and over who failed to reply, I sincerely trust that some available material will be forthcoming at the request of the next statistician.

40 East Forty-First Street.

Diphtheria Antitoxin in Treatment of Measles Bronchitis.—S. Licciardi has been much pleased with the effectual action of this treatment, which he has applied in thirty cases of bronchitis accompanying measles, including a number of young infants. His communication on the subject is published in the *Gazzetta Medica*, 1912, xxxviii, 478.

POSTOPERATIVE MORTALITY FROM ANESTHETICS

THE RECORDED DEATH-RATE FROM ETHYL CHLORID *

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Deaths during or following surgical operations occur under three conditions: (1) from causes entirely independent of the anesthetic; (2) from causes to which the anesthetic contributes, and (3) solely from the anesthetic.

I. THE FATALITY ENTIRELY INDEPENDENT OF THE ANESTHETIC

Deaths of this class, in order of their frequency, are most often due to: (a) peritonitis, (b) septicemia, (c) pulmonary, cardiac or cerebral embolism, (d) hemorrhage. In such cases, the influence of the anesthetic need not be considered.

II. THE ANESTHETIC CONTRIBUTING TO THE FATALITY

These deaths, in order of their frequency, are most often due to: (a) shock, (b) pneumonia, (c) nephritis, (d) endocarditis or myocarditis, (e) suffocation from inspired vomitus. When a patient, organically diseased, dies during or following the administration of an anesthetic, or when the anesthetic indirectly induces the lesion which is the cause of death, the anesthetic is a contributing cause of the fatality. If a man were pushed in front of a rapidly-moving train, his death would be due to the impact of the moving body, yet the force which placed him in the unfortunate position should be considered a contributing cause of the fatality. In the postoperative deaths of this class, the anesthetic is the force which pushes the patient into the path of danger.

The following case, which has not been previously reported, is an example of this class of fatality:

CASE 1.—The patient, a stout white man, aged 79, with a short, thick neck, was suffering from an incarcerated inguinal hernia. The duration of the trouble had been eighteen years. The hernia had been strangulated for twenty-four hours. The patient had vomited for twelve hours. There was a large mass in the scrotum. The abdomen was distended and tympanitic. The anesthetic was nitrous-oxid-oxygen. An incision was made over the external abdominal ring. Three minutes after the beginning of anesthesia, the patient vomited a large amount of fluid. The vomiting was continuous for several minutes. The patient did not breathe after the vomiting commenced and soon was pulseless. After death, large amounts of fluid could be expressed through the mouth by pressure on the abdomen.

It has happened many times and under all anesthetics that a patient in this condition has vomited a large amount of fluid at the moment when anesthesia was complete and has drowned in his own vomitus. The same accident might occur under an ideal anesthetic. The death, therefore, is not due to the anesthetic, yet without the influence of the anesthetic, death would not have occurred at this time or in this manner. The anesthetic is the force which pushed the patient in the way of the fatality. The death is one due to asphyxiation from inspired vomitus. Nitrous-oxid-oxygen anesthesia was a contributing cause.

III. THE FATALITY DUE SOLELY TO THE ANESTHETIC

These deaths are due to: (a) an overdose of the anesthetic, (b) improper administration, (c) a susceptibility of the patient to the anesthetic agent employed.

A standard for determining what constitutes a death due to an anesthetic is furnished by a supposably ideal anesthetic. Death would never be caused by such an anesthetic, yet deaths due to other causes would occur during or following its administration. Bearing in mind these characteristics of an ideal anesthetic, we can formulate the following rule:

Death during or following an operation is due to the anesthetic if the death would not have occurred under an ideal anesthetic. The following case is an example:

CASE 2.—The patient was a colored woman, well-developed and well-nourished, aged 22. The diagnosis was acute appendicitis. The duration of the trouble had been eight days. The heart and lungs were normal. There was rigidity of the right rectus muscle and tenderness over the right lower quadrant of the abdomen. The temperature was 100; the pulse, 82; the respiration, 20, and the white count, 18,000. It was impossible, from the history or from the examination, to predict the catastrophe which followed. The anesthetic was ethyl chlorid administered as a preliminary to ether. On changing to ether, the respiration became shallow and failed. Artificial respiration and stimulation were used without avail. The pulse stopped five minutes from the time the anesthetic had been started.

If an ideal anesthetic had been used in this case, the patient would probably not have died. The death was, therefore, due to the anesthetic.

The foregoing classification of postoperative deaths has been worked out from a study of the death returns of a city of 200,000 inhabitants for a period of ten years. In these records there are seven deaths due to ether, four to chloroform and one to ethyl chlorid. The death-rate due solely to anesthetics was one in 4,591 operations. The anesthetic contributed to the fatality once in 880 cases.

The greatest confusion exists concerning the degree of danger attending the use of the general anesthetics. The published death-rate from ether varies from one in 481 to one in 23,204 cases. The death-rate from chloroform is given as from one in 1,186 to one in 11,448 cases. The statistics of nitrous oxid vary from one death in 100,000 to 1 in 750,000 cases. The usual sources of error in estimating the danger from anesthetics are as follows:

1. Only a small proportion of the deaths from anesthetics are reported.
2. It is impossible to determine accurately the total number of administrations.
3. There has been no standard for determining what constitutes a death from an anesthetic.

These objections may be obviated for the most part by collecting the records of deaths due solely to the anesthetic in series of cases reported from personal observation. It would also be of interest to collect separately, from similar series of cases, the record of cases in which the anesthetic contributed to the fatality, and also of the deaths which occurred independently of the anesthetic.

The mortality-rate from ethyl chlorid as a general anesthetic has been computed in the usual way with the results given in Table 1.

TABLE 1.—ESTIMATED MORTALITY-RATE FROM ETHYL-CHLORID AS A GENERAL ANESTHETIC

Observer			Death-Rate	Observer			Death-Rate
Hare	1	in	2,000	Lotheissen	1	in	12,000
McCardie	1	in	3,000	Ware	1	in	12,436
Luke	1	in	8,000	Seitz	1	in	16,000
Hewitt	1	in	10,000	Lotheissen	1	in	17,000
McCardie	1	in	10,000	Luke	1	in	36,000
Ware	1	in	11,207	Luke	1	in	150,000

* Read in the Symposium on Anesthesia in the Sections on Pharmacology and Therapeutics and Pathology and Physiology of The American Medical Association, at the Sixty-Third Annual Session, held at Atlantic City, June, 1912.

The obvious inaccuracy of some of these estimates is due to all three of the causes to which we have alluded as producing error in estimating, in the usual way, the mortality from an anesthetic.

The reported deaths under ethyl chlorid are given in Table 2.

The first death from ethyl chlorid was reported by Lotheissen. McCardie collected reports of eight deaths, including Lotheissen's case. Luke collected reports of sixteen deaths, including McCardie's list. McCardie collected reports of twenty-one deaths, including Luke's sixteen. In the same paper, McCardie referred to nine other deaths "which have occurred in the north of England, although no details are obtainable." These nine deaths are not included in Luke's list of twenty-two deaths. McCardie collected reports of 9,711 cases of ethyl chlorid anesthesia in the vicinity of Birmingham, England, with four deaths, a mortality of one in 2,228.

TABLE 2.—DEATHS REPORTED UNDER ETHYL-CHLORID

	Observer	Cause of Death
1.	Lotheissen	Anesthetic. Ethyl-chlorid.
2.	Bossart	Obstruction. Laryngeal diphtheria.
3.	Allen	Asphyxiation from inspired vomitus.
4.	Luke	Anesthetic.
5.	McCardie	Asphyxiation from fold of mucous membrane.
6.	McCardie	Anesthetic.
7.	McCardie	Pericarditis, endocarditis.
8.	Luke	Anesthetic.
9.	Luke	Anesthetic, dental case.
10.	Luke	Anesthetic, dental case.
11.	Luke	Anesthetic, dental case.
12.	Luke	Anesthetic.
13.	McCardie	Anesthetic, dental case.
14.	Luke	Anesthetic.
15.	McCardie	Anesthetic, dental case.
16.	Luke	Anesthetic, dental case.
17.	Louisson	Anesthetic.
18.	Hilliard	Anesthetic, dental case.
19.	McCardie	Anesthetic.
20.	McCardie	Anesthetic.
21.	McCardie	Anesthetic, dental case.
22.	McCardie	No details.
23.	McCardie	No details.
24.	McCardie	No details.
25.	McCardie	No details.
26.	McCardie	No details.
27.	McCardie	No details.
28.	McCardie	No details.
29.	McCardie	No details.
30.	McCardie	No details.
31	Luke—Case 17	Anesthetic, dental case.
32.	Luke—Case 18	No details.
33.	Luke—Case 19	Anesthetic, dental case.
34.	Luke—Case 20	No details.
35.	Luke—Case 21	No details.
36.	Luke—Case 22	No details.
37	Luke	No details.
38.	Gibbon	Ludwig's angina, endocarditis.
39.	Lee—Case 22	Tuberculous pericarditis.
40.	Lee—Case 23	Empyema of pleura and pericardium.
41.	Lee—Case 24	Edema of glottis, Ludwig's angina.
42.	Lee—Case 25	Anesthetic.
43.	Miller	Anesthetic.

He says: "The mortality in the Birmingham district will not be quite indicated by these figures. We might fairly place the total number of administrations at 12,000 and call the mortality about one in 3,000." Lee collected reports of a series of 5,575 cases of ethyl chlorid anesthesia at the Pennsylvania Hospital with five deaths, of which only one was due solely to the anesthetic.

Fourteen of the forty-three reported deaths under ethyl chlorid were reported with no details and we cannot judge whether or not the anesthetic is to be blamed for the fatality or if cases have been reported more than once. In twenty-one of the remaining twenty-nine cases the death, judged by the rule previously given, seems to have been due to the anesthetic. In eight cases the anesthetic contributed to the fatality. While we have twenty-one reported deaths due to ethyl chlorid, we are certain that this is only a small proportion of all that have occurred. We are also unable to estimate closely the total number of administrations, although we know that it is very large. From these figures we are unable to estimate closely the rate of mortality due to ethyl chlorid.

Observers have reported from personal knowledge the series of cases in Table 3. Deaths not due to the anesthetic and isolated deaths not reported in series of cases are not included in this table.

TABLE 3.—SERIES OF ETHYL-CHLORID ANESTHESIAS REPORTED FROM PERSONAL KNOWLEDGE

Observer	Cases	Deaths	Observer	Cases	Deaths
Soullier	8,417	0	Luke	2,000	0
Lotheissen	2,550	1	Tuttle	230	0
Ware	2,000	0	Herrenknecht	3,000	0
Cumston	197	0	Leighton	79	0
Newman	1,867	1	Greene	12,000	0
Koenig	40	0	Lee	5,575	1
Malherbe	170	0	Dodge	300	0
Wiesmer	400	0	Webster	1,880	0
Allen	60	0	Miller	6,648	1
Murray	350	0	Hornabrook	3,500	0
McCardie	1,000	0	Stieda and Zander	1,000	0
Barton	200	0			
Total				53,463	4

The proportion of deaths due to ethyl chlorid derived from Table 3 is one in 13,365. This is the mortality-rate of ethyl chlorid as recorded in medical literature. If we were able to estimate closely the tremendous number of times that this anesthetic has been used in dental and surgical cases and compare this figure with the reported number of deaths, we would obtain a result more favorable to the anesthetic. This result, however, would be inaccurate, for we are certain that many deaths have not been reported.

From nitrous oxid, the safest of anesthetics, there have been reported at least thirty-two deaths, of which nineteen were due to the anesthetic. The reported deaths under nitrous-oxid-oxygen are collected in Table 4.

TABLE 4.—DEATHS UNDER NITROUS-OXID-OXYGEN ANESTHESIA

	Observer	Cause of Death
1.	Teter	Shock and primary cardiac failure.
2.	Crile	Myocarditis, six hours after operation.
3.	Lydston	Anesthetic.
4.	Allen	Uremia.
5.	Allen	No details.
6.	Allen	No details.
7.	Gatch	Hyperthyroidism.
8.	Gatch	Pericardial effusion.
9.	Gatch	Lymphatic diathesis.
10.	Olow	Diseased heart and arteries.
11.	Boys	Anesthetic.

Two of these deaths were due to the anesthetic and in seven others the anesthetic contributed to the fatality.

The study of the statistics at present available does not enable us to gauge absolutely the relative safety of the general anesthetics. We are able, however, to arrange them, in respect to their safety, in the following order: (1) nitrous oxid, (2) ether, (3) ethyl chlorid, (4) chloroform.

Nitrous oxid and ethyl chlorid have been used almost exclusively for brief operations, and for this reason must be compared, in the consideration of safety, with each other and not with ether and chloroform. As nitrous oxid is undoubtedly much safer than ethyl chlorid, it must always be chosen, unless in rare cases there may be special indications for the use of ethyl chlorid.

This study must impress us with the fact that at the present time there is no intrinsically safe general anesthetic. In each and every case the greatest safety for the patient results from the most careful administration of the smallest possible quantity of the anesthetic agent chosen. The cooperation of surgeons with anesthetizers is necessary to bring about this happy result.

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THE LIMITATIONS OF NITROUS OXID WITH OXYGEN AS A GENERAL ANESTHETIC*

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Owing to the great interest manifested in nitrous oxid and oxygen anesthesia in general surgery, it becomes advisable to make clear the requirements and limitations of this combination, in order to maintain its present popularity as approaching the principles of an ideal anesthetic, and to avoid the sacrifice of life which may result in consequence of ignorance concerning the action of these peculiar gases.[1]

Of the general anesthetic agents now employed the combination of pure nitrous oxid with oxygen, when properly administered, is the safest, the most agreeable and the freest from post-anesthetic complications. It is to be regretted, however, that it is by far the most difficult general anesthetic to administer properly, for the following reasons:

1. The physical properties of nitrous oxid are such that this gas must be given from 80 to 95 per cent. pure, in order that the tension of the gas in the blood be sufficient to produce the physicochemical change in the nerve-cells which brings about the anesthetic state. Because of this fact one is constantly confronted with the problem of asphyxia, which is practically the only danger of gas-oxygen anesthesia when pure gases are employed.

2. The anesthetic properties of nitrous oxid are extremely evanescent. The patient can pass from profound anesthesia to the conscious state within sixty seconds. The extreme rapidity of induction and elimination makes the administration of this anesthetic very difficult.

3. Muscular tone is maintained to a much greater extent than when ether or chloroform is used, it being impossible to obtain the same degree of flaccidity of the musculature that can safely be procured with the more powerful anesthetic agents.

In consequence of these peculiar properties it is necessary to utilize every known scientific principle that will enhance its efficiency in order to make nitrous oxid practical as an anesthetic agent.

Before presenting, specifically, the requirements and limitations of gas-oxygen anesthesia, the following scientific principles which have proved of value in the administration of this agent may be briefly reviewed: (1) the use of preanesthetic narcotics; (2) the use of oxygen; (3) the even flow of both nitrous oxid and oxygen; (4) warm gases; (5) rebreathing; (6) positive pressure.

THE USE OF PREANESTHETIC NARCOTICS

The advisability of employing narcotic medication previous to the administration of any inhalation anesthetic is now generally recognized by the profession. The reasons for this are that the patient comes into the operating-room composed and tranquil; that the induction period is shortened; that excitement is lessened or entirely eliminated; that more profound anesthesia is obtained, with greater relaxation in proportion to the quantity of general anesthetic employed; that hypersecretion of mucus and cardio-inhibitory shock are prevented.

None of the narcotics employed may be regarded as ideal. I have used morphin and atropin, scopolamin and morphin, but have generally confined myself to morphin and atropin.

Retching on the part of the patient during the progress of an operation is of the greatest annoyance not only to the anesthetist but to the surgeon as well. This has been quite difficult to overcome with the gas-oxygen anesthesia when a non-asphyxial stage is maintained and all cyanosis eliminated. In many cases it is possible to carry the patient along in a natural-appearing sleep, and with sufficient relaxation to necessitate a comparatively light anesthesia, but to have the anesthesia marred by the occurrence of retching.

THE ADVANTAGE OF USING PURE OXYGEN

It has been stated that it is necessary to administer nitrous oxid from 80 to 95 per cent. pure, in order that the blood may become sufficiently saturated to produce the anesthetic state. This being true, there is not enough oxygen available from the atmosphere, in the majority of cases, to make the nitrous oxid respirable, owing to the large percentage of nitrogen in the atmosphere. The average patient, for example, will require 88 parts of nitrous oxid to produce a satisfactorily deep anesthesia, which would leave 12 parts atmospheric air. As the air contains only about 1/5 oxygen there would be only about 2 2/5 parts of oxygen available. Nitrous oxid is not respirable with less than 7 to 20 parts of pure oxygen. Therefore, a satisfactory anesthesia for general surgery cannot be obtained with nitrous oxid and atmospheric air.

On a number of occasions I have been unfortunate in having the oxygen supply fail and in being compelled to maintain the anesthesia with nitrous oxid and atmospheric air. Anesthesia in every instance was continued to the completion of the operation. In some cases there was a considerable degree of cyanosis and rigidity of muscles, and the condition of the patient was very unsatisfactory as compared with that obtained while using pure oxygen.

AN EVEN FLOW OF THE GASES

One of the most essential principles involved in the successful administration of gas-oxygen is the maintenance of a definite and even flow of both the nitrous oxid and the oxygen. I have referred to this feature in former papers.[1,2] With a definite, even flow of the gases it is comparatively easy to anesthetize successfully the majority of patients. When profound anesthesia has been obtained, and when the proper proportion of nitrous oxid and oxygen for the individual case has been determined, it will not be necessary to change the proportion of the gases to any great extent throughout the remainder of the operation. In many of my cases it was not necessary to change the proportion of the gases after the first fifteen minutes, in some instances the flow being continued without interruption for over an hour. An even narcosis is usually the result if the respiratory passages are not obstructed. The adoption of this method gives, relatively, a more profound narcosis followed by less nausea, and the work of the anesthetist is thereby greatly simplified.

The gases should be under control, with definite known pressures. This is accomplished by a pressure

* Read in the Symposium on Anesthesia in the Sections on Pharmacology and Therapeutics and Pathology and Physiology of the American Medical Association, at the Sixty-Third Annual Session, held at Atlantic City, June, 1912.

1. Teter: Requirements and Limitations of Nitrous Oxid and Oxygen as a General Anesthetic in Major Surgery, Lancet-Clinic, Jan. 21, 1911.

2. Teter: Thirteen Thousand Administrations of Nitrous Oxid with Oxygen as an Anesthetic, THE JOURNAL A. M. A., Aug. 7, 1909, p. 448.

regulator which is incorporated in the apparatus or attached to large cylinders. It is possible by this means to obtain definite proportions of nitrous oxid and oxygen which will continue in the same proportions until a change is indicated.

No definite percentage of the gases is uniformly satisfactory, for the different patients or for the same patient at different times. Numerous factors are responsible for this, such as type of patient, depth and frequency of respirations, obstructed air-passages, reflex from surgical trauma, position of patient and degree of shock encountered. The average amount of oxygen used, however, is 16⅔ per cent. Anesthesia lasting one hour requires, on an average, 100 gallons of nitrous oxid and 20 gallons of oxygen.

I made an effort to secure definite known percentages of nitrous oxid and oxygen put up in high-pressure cylinders. This was found to be impracticable for the reason that the percentages changed, as shown by daily tests.[3]

It is not essential that the exact percentages of the gases be known, but it is essential that there be some means for obtaining definite and accurate amounts, as may be indicated by the symptoms of the patient. Many accidents have been caused by the failure of the patient to receive the amount of oxygen indicated on the apparatus. It is impossible to control the percentages of the gases by having the controlling valves between the gas-bags and the inhaler, on account of the impossibility of maintaining definite pressure in the bags. The only positive way is to have the gases at known pressures and the controlling valves between the gas-bags and the gas-supply. In this way one can be absolutely sure of obtaining the amount of gases indicated. This is a very important feature.

WARM GASES

It is an established fact that all anesthetics are safer when administered warm. Gwathmey[4] was the first, I believe, to experiment on animals with warm and cold nitrous oxid and oxygen. He found that nitrous oxid and oxygen, administered warm, are over twice as safe as when given at their normal temperature, and from three to five times as safe as the cold gases; also, that all anesthetics, heated to the body temperature, are increased in value as regards life, without a decrease in their anesthetic effects.

My clinical experience has substantiated Gwathmey's laboratory results, not only with regard to the increased safety of nitrous oxid and oxygen as an anesthetic, but with reference to the anesthesia being induced more quietly and more profoundly.

In a series of forty cases I compared the length of time necessary to produce anesthesia with warm and cold nitrous oxid. When pure nitrous oxid was used anesthesia was marked by the absence of the lid reflex and the beginning of stertorous respiration. The average time consumed in producing anesthesia with nitrous oxid at 90 F. was thirty seconds, and the average time with the nitrous oxid at 42 F. was fifty-two seconds.

Many of the patients to whom the warm gas was given said they knew nothing after from the second to the sixth inhalation, while most of those taking the cold gas were conscious up to the tenth and some of them to the twentieth inhalation. All of these patients were women from 18 to 60 years of age.

Warm nitrous oxid is more readily absorbed by the blood than is the cold gas, and the resulting anesthesia is more profound. About 90 F., in my experience, is the best temperature for inhalation. The gas should be of this temperature when it reaches the inhaler. A higher temperature raised the body temperature two to three degrees in some cases, and exhaustion was quite frequently noticed.

REBREATHING OF THE GASES

The method of rebreathing nitrous oxid is not new, having been used to a certain extent from the time anesthetics were discovered. Hewitt[5] speaks of to-and-fro breathing, but his experience was confined to this method only to the extent of inducing anesthesia and not to its continuous application.

To Dr. W. D. Gatch[6] of Baltimore, however, properly belongs the credit for placing on a scientific basis the method of rebreathing nitrous oxid and oxygen. He employed the method of rebreathing in a large number of major surgical cases at Johns Hopkins Hospital during his internship.

I have been using the method of rebreathing since September, 1907, in all anesthetics for general surgical cases. Being aware of the fact that the exhalations of the patient under nitrous oxid and oxygen anesthesia contain about 80 per cent. of nitrous oxid, I have utilized the exhalations as much as possible, still keeping the tension of the nitrous oxid up to the extent necessary to produce surgical anesthesia and allowing enough oxygen to eliminate the asphyxial factor. My purpose in using this method was to conserve the nitrous oxid and oxygen on account of the expensiveness of these gases. I found it possible, however, to obtain more satisfactory anesthesia by this means, with no alarming symptoms or serious results.

Gatch[7] gives reasons for the beneficial effects of rebreathing the gases to a certain extent, and refers in this connection to the work on "Acapnia and Shock" done by Yandell Henderson, professor of physiology in the Yale Medical School. According to Henderson,[8] by far the greater number of all deaths under anesthesia are fundamentally due to acapnia (diminished carbon dioxid in the blood and tissues) resulting from the excessive pulmonary ventilation during the stage of excitement.

As the respirations of patients under nitrous oxid and oxygen are greatly increased, in both volume and frequency, it is readily seen that this excessive pulmonary ventilation may rapidly take carbon dioxid from the blood. By allowing the patient to rebreathe some of his own carbon dioxid the normal amount of this substance in the blood may be maintained. Henderson[9] states, however, that "it must be remembered that carbon dioxid is a powerful drug and one to be administered in small quantities only, never in greater concentration than 5 or 6 per cent."

With the amount of rebreathing which I employ, the concentration of carbon dioxid is from 5 to 9.5 per cent. I arrived at these figures by having the contents of six bags of gas analyzed. These tests were made as follows:

CASE 1.—A large woman, aged 51, was anesthetized for an operation which lasted one hour and twenty-four minutes.

3. Further analyses are being made in order to find out the causes of the changes in the percentages of nitrous oxid and oxygen compressed in the same cylinder.
4. Gwathmey: Warm Versus Cold Anesthetics, New York State Jour. Med., February, 1908.
5. Hewitt: Text-Book, Anesthetics, Ed. 3, p. 273.
6. Gatch: THE JOURNAL A. M. A., Nov. 11, 1911, p. 1593.
7. Gatch: THE JOURNAL A. M. A., March 5, 1910, p. 775.
8. Henderson: Primary Heart Failure in Normal Subjects under Ether, Surg., Gynec. and Obst., August, 1911, p. 161.
9. Henderson: Fatal Apnea and the Shock Problem, Bull. Johns Hopkins Hosp., 1910, xxi, No. 233.

The proportion of nitrous oxid and oxygen that carried the patient along in profound anesthesia was arrived at fifteen minutes after anesthesia had been induced. The respirations were twenty-four to thirty per minute, being regular and of good volume. The first test bag was attached directly to the face inhaler and was soon filled with the gases the patient was breathing. The first test was made after the patient had been under the anesthetic twenty-five minutes. The second test bag was taken after the patient had been under the anesthetic for eighty minutes. No change was made in the proportion of the fresh nitrous oxid and oxygen used in these tests. I expected an exact percentage of carbon dioxid in each of the bags, but the analysis showed that bag No. 1 contained carbon dioxid 7.4 per cent., and bag No. 2 carbon dioxid 5.5 per cent. One hundred and twelve gallons of nitrous oxid and 26 gallons of oxygen were consumed.

CASE 2.—The patient was a man, aged 60, weighing 190 pounds and having a short, thick neck. The operation was a double herniotomy. Some difficulty was experienced in obtaining complete relaxation of the musculature, and it was necessary to keep changing the proportions of nitrous oxid and oxygen more or less for the first twenty-five minutes, after which time no change was made for forty-five minutes. The first test bag was taken thirty minutes and the second sixty minutes after the anesthesia was started. The analysis of Bag 1 showed carbon dioxid 5.125 per cent.; Bag 2 showed carbon dioxid 3.43 per cent. The length of operation was one hour and ten minutes. One hundred and fifty gallons of nitrous oxid and 28 gallons of oxygen were used. The patient's respirations were from thirty to thirty-eight per minute, being full and regular.

CASE 3.—The patient was an anemic, frail woman. The operation was vaginal plastic and laparotomy. The length of operation was one hour and thirty-eight minutes. The proportion of nitrous oxid and oxygen was arrived at in about eight minutes. No change in this proportion was necessary throughout the remainder of the operation.

The first test bag was secured twenty minutes and the second one hour and twenty-five minutes after the anesthetic was started. Bag 1 showed carbon dioxid 8.6 per cent.; Bag 2, carbon dioxid 5.25 per cent. The amount of nitrous oxid used was 118 gallons, of oxygen, 27 gallons. The average respirations were thirty-two per minute, regular but rather shallow.

No ether was used in any of these cases.

It is interesting to note the difference in the percentage of carbon dioxid when the proportion of fresh gas being used is not changed, the same amount of rebreathing being thus assured. The small percentage obtained after the patient had been under for some time may have been due to the fact that the metabolic process was being interfered with, showing the influence of shock.

The average patient under nitrous oxid and oxygen will breathe 600 c.c. at each inhalation and will inhale about thirty times a minute, making 270 gallons of gas per hour. By the method of rebreathing which I employ, 100 gallons of nitrous oxid and 20 gallons of oxygen per hour, as a rule, are utilized. The difference between 270 and 120 is 150 gallons, which represents the amount rebreathed. With this amount of rebreathing there is no danger of carbon dioxid poisoning, nor is there present enough carbon dioxid to lower the tension of nitrous oxid below that necessary to produce surgical anesthesia.

The proper amount of rebreathing of nitrous oxid and oxygen must be governed by the symptoms in each individual case. If too much rebreathing is allowed, the patient will show symptoms of light anesthesia, quickly followed by asphyxial manifestations. An excessive amount of carbon dioxid will be manifested first by rapid, forced respiratory efforts, followed by sweating, livid appearance, gradual slowing of pulse and finally cessation of respiration.

POSITIVE INTRAPULMONARY PRESSURE

It is known that the blood will absorb 45 volumes of nitrous oxid to 100 volumes of blood at atmospheric pressure. I found that more profound anesthesia resulted when nitrous oxid under positive pressure was administered. This indicated that a greater amount of gas is absorbed when increased pressures are used.

In 1907, I began to use positive intrapulmonary pressure in the administration of nitrous oxid and oxygen for surgical purposes. My first work was for Dr. C. B. Parke of Cleveland. The operation consisted in the resection of four or five ribs for extensive empyema, involving both lungs. I have administered nitrous oxid and oxygen with positive pressure for intrathoracic surgery in eighteen cases. Being able to control accurately the pressure of the gases, I have never encountered even a temporary cessation of respiration in these cases. I soon noticed that more profound narcosis resulted when using positive pressure than when not using it, and have therefore utilized this additional factor in all my anesthetic work.

I am familiar with Paul Bert's[10] theory and know that his patients were placed in an air-tight chamber and were subjected to increased pressure, and that the pressure was increased not only within the lungs but without as well. Also, I know of the work done by Willy Meyer[11] on "Pneumectomy with the Aid of Differential Air-Pressure." Bunnell,[12] in a recent article, reports three cases of thoracic surgery in which he used positive pressure.

I have been able to administer nitrous oxid and oxygen, with ether also if needed, with excellent results, in all intrathoracic surgical cases that have been presented. The lungs can be held in their normal position or can be extended more or less, if desirable. The best working pressure, in my experience, is from 6 to 8 mm. of mercury; a much greater pressure, however, may be used without producing any alarming symptoms. In patients possessing heavy, powerful, muscular chests, a pressure of 24 to 30 mm. of mercury may be safely employed.

The objection that it is a dangerous practice to use positive pressure in anesthetic work is a theoretic hypothesis which is not borne out by the clinical facts. It is essential, however, that the pressure employed be known. A very simple positive-pressure valve makes this possible. The utilization of positive intrapulmonary pressure in the administration of nitrous oxid and oxygen is not dangerous; on the contrary, it is an important factor in the production of a safe, profound, even anesthesia. In addition to this it renders possible the safe performance of intrathoracic surgery.

CLINICAL EXPERIENCE

Laboratory experimentation amounts to little unless its results are borne out by practical clinical experience. Quite as much may be learned from clinical observation as from laboratory research work, provided the same accurate and painstaking methods are employed. It may not be amiss, therefore, in this connection, to review briefly personal experience with nitrous oxid and oxygen employed according to the principles above outlined.

During the past eight years I have advocated the advantages of nitrous oxid with oxygen as a general anesthetic. I have administered gas-oxygen anesthesia

10. Hewitt: Text Book, Ed. 3, p. 303.
11. Willy Meyer: Pneumectomy with the Aid of Differential Air Pressure: An Experimental Study. THE JOURNAL A. M. A., Dec. 11, 1909, p. 1978.
12. Bunnell, Sterling: The Use of Nitrous Oxid and Oxygen to Maintain Anesthesia and Positive Pressure for Thoracic Surgery. THE JOURNAL A. M. A., March 23, 1912, p. 835.

to patients of all types and of all ages, for every conceivable operation, lasting from a few minutes to four hours and eight minutes. I will not attempt to enumerate and classify the different operations. It may be stated, however, that there is no operation performed at the present time in which nitrous oxid and oxygen, or nitrous oxid and oxygen with ether cannot be employed. For operations within the nose, mouth or throat, gas-oxygen may be administered continuously by means of the nasal inhaler, mouth tube or intratracheal tube. For all other operations the face inhaler is employed.

I have classified my administrations as to the length of anesthesia maintained. The following anesthetics were given for general surgical cases, from April 1, 1904, to May 1, 1912:

Administrations lasting 15 minutes or less	5537
Administrations lasting from 15 minutes to 30 minutes	1007
Administrations lasting from 30 minutes to 1 hour	470
Administrations lasting from 1 hour to 2 hours	336
Administrations lasting from 2 hours to 3 hours	34
Administrations lasting from 3 hours to 4 hours	2
Administrations for oral operations lasting from 15 minutes to 30 minutes	2496
Total administrations for general surgery and oral surgery	9882

In addition to this number I have administered nitrous oxid and oxygen by means of the continued nasal method for the extraction of teeth, 14,070 times.

In this large number of administrations I have had but one fatality which I reported in detail in a paper read before a section of this Association in 1909.[2] This was not, strictly speaking, an anesthetic death. I am aware, however, of sixteen fatalities that have occurred during the administration of nitrous oxid and oxygen. In a large percentage of these cases the patients were also receiving ether. From this it will be seen that gas-oxygen anesthesia is not without its dangers — hence, the reason for this paper.

LIMITATIONS OF NITROUS OXID AND OXYGEN

Having reviewed the scientific principles which have proved of value in the administration of nitrous oxid and oxygen, and personal experience with this combination employed in accordance with the principles stated, the specific limitations of this anesthetic may be given.

It is to be understood that the subject is discussed in a broad sense, bearing in mind the possibility of the administration of this anesthetic by persons not especially skilled in this form of anesthesia. It is a fact that the limitations of nitrous oxid and oxygen differ greatly in the hands of the expert and the average anesthetist. Probably the greatest limitation of this agent is the inability of the anesthetist to master and carry out the fundamental principles to which I have referred. For this reason, should I ever be so unfortunate as to undergo a major operation when the services of an expert anesthetist with nitrous oxid and oxygen are not available, I should prefer to take my chances with ether in the hands of an inexperienced person.

With the understanding, as above stated, I consider nitrous oxid and oxygen to be contra-indicated for any operation in children under 5 years of age. The reasons for this are that young children are easily asphyxiated, that they are easily thrown into epileptiform twitching of the body, that they readily assume the opisthotonos position and that they as readily come from under the effects of the gas. It is therefore a very difficult matter to administer successfully nitrous oxid and oxygen to young children.

This agent is also contra-indicated in old people, in whom a degenerative process of the body is manifested, especially when a severe degree of arteriosclerosis is present. The reason for including this class of cases is the likelihood of a certain amount of asphyxia accompanying the anesthesia. In 1909, I reported before this Association[2] some cases showing the condition of the brain when the patient was under the influence of nitrous oxid and oxygen. If anesthesia is accompanied by cyanosis the brain is greatly congested and so dilated that it not only completely fills the cranial cavity but protrudes from the opening in the skull. In the presence of a diseased and weakened condition of the walls of the vessels in the brain the above phenomenon would undoubtedly prove injurious, if not fatal, in some cases. In the aged, however, if a non-asphyxial form of anesthesia can be secured throughout, nitrous oxid with oxygen is without question the best anesthetic to be employed. Some of my most gratifying cases have been old people, and I have had no bad results with this class of patients. I have always maintained a non-asphyxial narcosis, not hesitating to use some ether if necessary.

It would be very unwise to attempt to anesthetize with nitrous oxid and oxygen a strong, vigorous, rough man, whose habits include the excessive use of tobacco and liquor, unless the anesthetist has developed great proficiency with this agent.

Unless a desired depth of anesthesia can be obtained in a given case without a marked degree of asphyxia it is much safer to use more oxygen, a little less nitrous oxid and to add enough ether to secure the proper amount of relaxation. A slight degree of cyanosis is not objectionable nor is it dangerous. If less than 11 per cent. of oxygen is used with nitrous oxid more or less cyanosis is manifested. A slight degree of cyanosis is the rule with this form of anesthesia, unless a large dose of some preanesthetic narcotic has been given or some ether is administered with the gases. The percentage of ether given with the gases should be known as far as that is possible.

The perecentage of cases in which it is necessary to use ether with the gases depends on both the operating surgeon and the anesthetist. After a time surgeons become accustomed to working under nitrous oxid and oxygen and do not require as complete relaxation as they did at first. The anesthetist's technic should develop so that a more profound and even anesthesia can be obtained. The anesthetist who works with only one surgeon should not be compelled to resort to the additional help of ether in more than from 5 to 8 per cent. of the cases. One who is administering nitrous oxid and oxygen for a large number of different surgeons would probably be compelled to use ether in from 20 to 25 per cent. of the operations.

The amount of ether employed with the gases varies from 2 to 8 per cent. It is not necessary, as a rule, to use ether after the patient is well under. When ether is employed in this way it is possible to depend on the nitrous oxid and oxygen as a general anesthetic in practically every case. I have met with but two cases in which it was necessary to discontinue the nitrous oxid, oxygen and ether. In one case the operation was finished with chloroform and in the other with pure ether, but satisfactory anesthesia could not even then be obtained.

Nitrous oxid and oxygen anesthesia is not ideal for major surgery on patients possessing strong, vigorous constitutions or extremely nervous temperaments, or in those addicted to drug habits or the excessive use of tobacco. In other words, any patient who requires a large amount of any general anesthetic is not a good

gas-oxygen subject to control, owing to the lighter form of anesthesia induced by nitrous oxid.

The ideal patients for nitrous oxid and oxygen anesthesia are the very ill, the anemic, the debilitated, those possessing low vitality from any cause — in short, all cases except those requiring a powerful anesthetic agent. The great majority of all cases can be handled safely and successfully if the principles herein set forth are skilfully followed.

Rose Building.

HELPS IN SURGICAL ANESTHESIA*

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I offer the following helps for use in the open or drop method of administering ether. This is the most popular method in this country, and is without doubt the easiest, simplest and safest for the majority of anesthesias, especially for those of limited experience.

Fig. 1.—Dropper from original can.

This dropper is made from the original ether can (Fig. 1 A) by cutting a circular incision through the soft metal cap of the can, as close to the edge of the neck as possible, holding the knife at right angles to the can. This is extended about four-fifths of the way round (Fig. 1 B). This flap is turned back and a small pledget of cotton inserted (Fig. 1 C); then the flap is turned down to its original position; this will hold the wick in place. Now it is ready for use. Drops of ether will fall from the end of the wick rapidly or slowly according as the can is tilted much or little. The size of the drops can be regulated by manipulation of the wick. If, after using, some ether remains in the can, the flap can be folded back again as in Figure 1 D which will entirely prevent the escape of ether from the can, yet leave the flap in good condition for another time. The advantages of this method of dropping ether are availability, simplicity and cleanliness. It costs nothing, leaves the purity and strength of the ether undisturbed, and if properly managed will not deluge the mask or the patient's face.

The rubber ether blanket is made of thin rubber sheeting about 9 inches square with a small hole in the center about 1 inch in diameter (Fig. 2). It can simply be laid on the mask or fastened by the holding wire, and may also be used to protect the eyes. It is especially useful when a strong ether is wanted.

The mask-holder is made by using one or more rubber bands attached to the holding wire or fastened with a safety-pin (Fig. 2). It may be used on one or both sides of the mask, and by keeping the mask in position will leave the hands free to be used.

Following is an easy way of applying the nasopharyngeal airway: A soft rubber catheter is slowly introduced through the nose, then the larger rubber tube is slipped over it (Fig. 3) and the catheter is withdrawn (Fig. 4). This allows the quick and easy passage of a tube which might otherwise cause hemorrhage or be delayed by a nasal deformity. The tube can be retained in position with a piece of adhesive plaster or by a safety-pin.

Fig. 5.—Tubes for mouth airway.

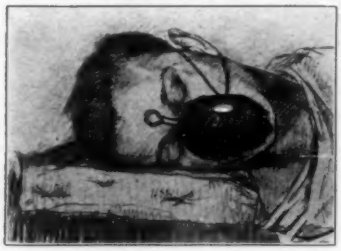

Fig. 2.—Rubber ether blanket and elastic mask holder.

Fig. 3.—Easy way of applying nasopharyngeal airway.

Fig. 4.—Nasopharyngeal airway.

The mouth airway consists of two rubber tubes, each 6½ inches long and three-eighths of an inch in diameter. The end in the pharynx as well as the one or two fenestras should have very smooth edges (Fig. 5). This is used when the tongue obstructs the airway.

In presenting two easy ways of giving nitrous oxid and oxygen with the Bennett inhaler, using only one bag (Fig. 6), I should like to give a word of warning. Many deaths have occurred under this form of anesthesia sequence, only a few of which have been reported. Even in the hands of the experienced, dangerous respiratory embarrassment may suddenly appear; then, too, the after-effects are not always ideal. After all, the latitude of safety is not so great as with ether. In many cases it is the best anesthetic to us, but we should not be

* Read in the Symposium on Anesthesia in the Sections on Pharmacology and Therapeutics and Pathology and Physiology of the American Medical Association, at the Sixty-Third Annual Session held at Atlantic City, June, 1912.

unmindful of its dangers and limitations. We have about ten compound, complicated and complex nitrous oxid and oxygen instruments on the market, each costing from $100 to $300, weighing from 40 to 80 pounds, and occupying as much space as a sewing-machine. Many of these instruments have so many valves and other parts as to suggest the need for an engineer's or chauffeur's license. I am sure that we are a trifle dishonest at times about this sequence, and that though we use morphin, nitrous oxid, oxygen and plenty of ether we call it a nitrous oxid and oxygen sequence.

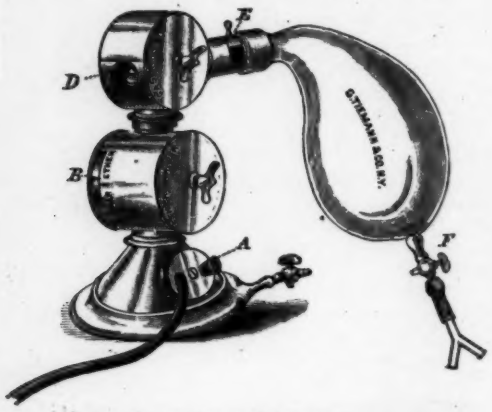

Fig. 6.—The Bennett inhaler.

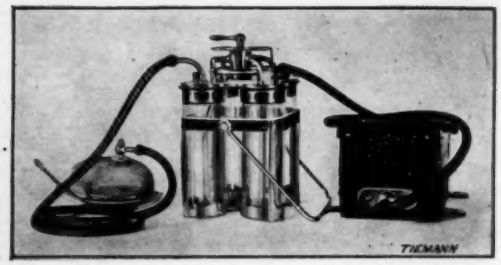

Fig. 7.—Four-bottle Junker vaporizer as modified.

Fig. 8.—The vapor mask.

Nitrous oxid and oxygen can easily be given in the following ways: (1) Simply use a Y-shaped tube at the end of the gas-bag to connect the two gases (Fig. 6 F). (2) Lead the oxygen direct from the tank to the Bennett inhaler by a rubber tube through one of the air-holes in the face-piece, plugging the other air-hole with a cork (Fig. 6 A). The Bennett inhaler is used chiefly to induce anesthesia with the gas-ether sequence. This instrument weighs only 2½ pounds, costs less than $50 and may be transported easily.

My four-bottle modified Junker vaporizer (Fig. 7) is an instrument allowing the easy and quick use of almost any anesthetic in any strength or combination, and is particularly useful for head and neck operations. One bottle can be used for warm water to warm the anesthetic vapor. Personally I prefer to use it as a means of catching any overflow that may result from filling the bottles too full or when too much pressure is used. Usually the other three bottles are used for ether and chloroform. Two bottles are filled with ether, and when one becomes too cold, as often happens after using it for a few minutes, or becomes empty, the other bottle is used. The vapor can be forced by a hand-bulb, such as is usually attached to a Paquelin cautery outfit, or a small foot-pump or bellows. The face or vapor mask which I use is similar to the ordinary face mask with an arrangement in the top for the distribution of the vapor in front of the nose (Fig. 8). This vapor mask is useful in giving oxygen with ether or chloroform by the drop method. The advantages of the so-called vapor method are: (1) less anesthetic is used; (2) there are less nausea and vomiting; (3) the breathing is more like that of normal sleep; (4) the apparatus is out of the surgeon's way; (5) the anesthetist's hands are free; (6) it will be found easy to change from one anesthetic to another, or to form any combination.

Fig. 9.—Glass nasal tubes for general anesthesia in use.

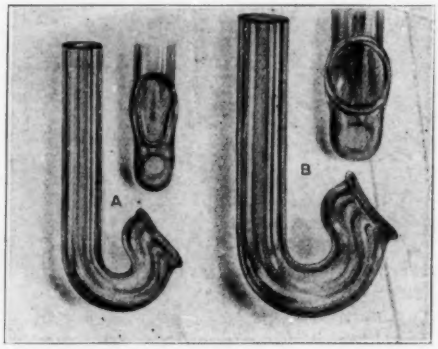

Fig. 10.—Glass nasal tubes for general anesthesia in head-surgery (A and B).

For special head cases I use glass nasal tubes (Fig. 9), which have these advantages over the rubber tubes: (1) They allow the anesthetic vapor to become warmed by passing through the nose; (2) they are more safely and easily introduced into the nose; (3) they do not cause nasal hemorrhage; (4) they are not apt to become

obstructed by blood and mucus; (5) they remain in position much better than do rubber tubes; (6) they are much easier to clean and sterilize.

They are made in three sizes accompanied with a Y-shaped glass connecting tube which is used for operations on the upper part of the head (Figs. 9 and 10).

1925 Seventh Avenue.

SPINAL ANALGESIA—DEVELOPMENT AND PRESENT STATUS OF THE METHOD

WITH BRIEF SUMMARY OF PERSONAL EXPERIENCE IN 1,065 CASES *

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Spinal analgesia proves no exception to the general rule which applies to new methods. Its early development was fraught with mistakes, some of which were serious and even fatal. When it was heralded throughout the world that Bier had successfully injected cocain into the spinal subarachnoid space, many surgeons adopted the method. It was a new field and little was definitely known concerning the physiologic aspects of the question, and little more with reference to the therapeutic phases of the subject. It was but natural that, as the literature of spinal analgesia developed, the number of unfortunate experiences multiplied. It was inevitable, too, that enthusiasm should wane, and that the further development of the method should be left to a limited number of surgeons who recognized in spinal analgesia a procedure of distinct advantage, with a definite field of usefulness.

Following Bier's first demonstrations of the surgical application of spinal analgesia, report of which was published in 1899, the method was quite extensively employed for two or three years. Accounts of its use then disappeared almost entirely from medical and surgical literature, though it was not abandoned by the few earnest advocates of the method. The revival of the subject in the literature about five years ago is familiar to all. It is safe to assume that spinal analgesia is now permanently established among recognized surgical procedures, and will never again so nearly approach abandonment as it did during the short period of quiescence which followed its first few years of popularity.

A just estimate of the merits of any method can be reached only by a study of the accumulated experience of many observers. It is manifestly impossible on this occasion to trace the evolution of spinal analgesia by a review of the literature which chronicles the findings of the large number of surgeons who are now employing or have employed the method.

During the early stage of the development of spinal analgesia cocain and eucain were the agents most generally employed. This fact probably accounts for many of the adverse opinions formed of the method. Eucain gave a "patchy," and hence altogether unsatisfactory analgesia. Cocain was not entirely satisfactory, partly because of the reckless dosage employed by many surgeons, and partly because of the difficulties experienced in sterilizing the drug without destroying its analgesic effect or decomposing it in such a way that its by-products gave rise to unpleasant accompanying or post-operative phenomena. Bier early protested against the reckless manner in which cocain was being employed, and against the dangerously large doses which some operators used. He made a plea for an effort to find less harmful drugs for the production of spinal analgesia.

A very important part of the evolution of spinal analgesia has been concerned with the discovery of other drugs and other combinations, which would give a controllable analgesia, and at the same time lessen the dangers and eliminate the frequently disagreeable accompanying symptoms associated with the method. In the endeavor to find such a drug a great deal of careful experimental work has been conducted by different investigators. The results have been remarkably successful, and have given to the method a definite field of usefulness.

My experience with cocain was not so unfavorable to that drug, probably because at an early stage of the development of spinal analgesia I formulated a plan of sterilizing the agent,[1] which insured not only a sterile but a fresh and active solution, free from the harmful by-products so often claimed to be present and generally attributed to the methods of sterilizing by heat.

It is not necessary here to enter into the question which from time to time has been raised concerning the validity of the claims that cocain is decomposed by heat and its analgesic properties destroyed as a consequence. Whether correct or incorrect, the impression has gained currency that boiling decomposes solutions of cocain. Various methods of sterilizing this agent have, therefore, been suggested. The simplicity of the method which I have employed renders it of value for emergency work, where a rapid method is required to secure a sterile, potent solution. The method, which is applicable to other analgesic agents as well as to cocain, is as follows:

Five grains of fresh cocain crystals, carefully weighed, are placed in a sterilized measuring glass. Two drams of strong ether are added and mixed thoroughly with the cocain crystals by means of a sterilized glass rod until a paste is formed. The mixing process is continued until all the ether is evaporated and a dry powder is obtained. One-half to 1 ounce of boiled, filtered water, or sterile normal salt solution, is then added. One-half ounce makes practically a 2 per cent. solution and 1 ounce a 1 per cent. solution. The dosage varies, according to the age of the patient, the region to be operated on, etc., from 5 to 25 minims of the 2 per cent. solution, and from 10 to 40 minims of the 1 per cent. solution.

The crystals, if kept dry, do not deteriorate, as do other forms of the drug. It is advisable, however, if possible, to employ only fresh crystals, or to be sure that they have been kept perfectly dry. With active cocain at one end of the scale and inert cocain at the other, there are various grades of potency, from an analgesic point of view. The exact cause of this variation is a matter of dispute, some holding that it is due to the heat sometimes employed in sterilization, others denying the correctness of this assertion. The members of the Section on Pharmacology and Therapeutics will doubtless clear up this point in the discussion.

Following the suggestion of Bier, that less harmful agents be found for spinal analgesia, experimentation has led to the employment of the following agents: stovain, novocain, tropacocain, beta-eucain, beta-eucain lactate, alypin, holocain hydrochlorid, orthoform (new),

* Read in the Symposium on Anesthesia in the joint meeting of the Section on Pharmacology and Therapeutics and the Section on Pathology and Physiology of the American Medical Association, at the Sixty-Third Annual Session, held at Atlantic City, June, 1912.

1. Bainbridge: Med. Rec., New York, Dec. 15, 1900.

anesthesin, and other agents. Cocain, stovain, novocain and tropacocain are the drugs most generally used, with stovain, perhaps, in the lead.

Other drugs than cocain having been found available for spinal analgesia, attention was next directed toward making such combinations of these with other substances as to render the solution heavier or lighter than the cerebrospinal fluid, the object being to avail oneself of gravity in controlling the height of the analgesia. Experimentation along this line has led to some very interesting results, and has evolved three general classes of solutions: (1) those of lighter specific weight than the cerebrospinal fluid; (2) those of approximately equal weight; (3) those of heavier weight.

To the first class belongs the so-called "diffusible" solution employed by Babcock, in which alcohol is used to render the fluid lighter than the cerebrospinal fluid.

To the second class belong the simple solutions of the analgesic agent with water, with water plus cerebrospinal fluid, with cerebrospinal fluid alone, or with normal salt solution.

To the third class belong the so-called "non-diffusible" solutions, which are rendered heavier than the cerebrospinal fluid by the addition of glucose, dextrin or gum arabic.

To any of these solutions may be added, if desired, epinephrin or some similar product, as employed by Bier, Gray and many others, or strychnin, as suggested by Jonnesco.

In 988 of my 1,065 cases simple solutions, of the second class, were employed, the agent being sterilized after the manner described, and dissolved in plain sterile water, without the addition of any other drug. In over 500 of the 988 cases cocain was used. In the remainder the various other agents and combinations were employed. I now use, as a rule, stovain or tropacocain, because fewer unpleasant symptoms are apt to ensue, but I do not hesitate to employ cocain.

In the 1,065 cases there was one death (with the diffusible stovain solution, probably due to status lymphaticus); one case of temporary partial paralysis with complete recovery;[2] one case of failure due to so-called "dry spine," in which puncture at different levels failed to bring cerebrospinal fluid; two cases with alypin, in which there was considerable respiratory depression, and one case of idiosyncrasy in which, after several attempts by spinal and local injection, the analgesia was almost *nil*. In all the other cases there were no accompanying or post-operative symptoms of permanent or serious moment.

ILLUSTRATIVE CASES WITH THE THREE CLASSES OF SOLUTIONS

SIMPLE SOLUTION (COCAIN WITH WATER)

CASE 1.—J. P. D., aged 31, was operated on Nov. 27, 1902, (case of Dr. William T. Scovil, of Richmond Hill, Long Island), under spinal analgesia, which I administered. The patient had been operated on two years before by Dr. George Ryerson Fowler for appendicitis, at which time ether anesthesia was employed. The patient suffered for a year and a half from postanesthetic asthma of such severity that it was necessary for him to sit up at night in order to breathe. This gradually subsided and for six months before I saw him he had not been troubled with it. When I was called in consultation, the patient was suffering from multiple strictures, which had become so tight that there was almost complete retention of urine. A filiform bougie could not be passed. Albumin and casts were present in the urine. Chronic endocarditis further complicated the condition. The patient's testimony was absolutely necessary in a forthcoming murder trial in which circumstantial evidence was so strong against the defendant that a verdict of guilty was almost a certainty. Nothing but the patient's testimony could save the man.

Treatment.—To operate under inhalation anesthesia was practically impossible. It was determined, therefore, to employ spinal analgesia. Cocain, 20 minims of a 2 per cent. solution, was injected and external and internal urethrotomy performed. Analgesia lasted two hours and ten minutes. The patient read and smoked during the operation. In two weeks he went into court, gave his testimony and cleared the defendant. The patient, who is still living and in a fair degree of health, has never suffered from asthma since the operation under spinal analgesia—an interesting coincidence at least.

CASE 2.—Mrs. M. D., aged 43, was admitted to the New York Skin and Cancer Hospital in October, 1911. Examination revealed a large deep tuberculous ulcer of the left leg, 6 by 5 inches in diameter, of three years' duration. On Dec. 20, 1911. the ulcer was excised, and the surface exposed to fulguration according to the de Keating-Hart method, with the long, high-frequency, high-tension, electric spark. Analgesia in this case was induced by means of 20 minims of a 2 per cent. solution of cocain. Eight minims injected at first proved insufficient, and after ten minutes another injection of 12 minims was made. Analgesia was complete to the nipple line in four minutes and lasted over an hour. There were no accompanying or postoperative symptoms of any moment, convalescence being entirely uneventful.

GLUCOSE-EPINEPHRIN-STOVAIN SOLUTION (NON-DIFFUSIBLE)

CASE 3.—L. L., female, aged 58, was admitted to the New York Skin and Cancer Hospital, March 18, 1911, for operation for lipomas of the abdominal wall, papilloma of neck, angiomas of abdominal wall and varicose veins of the legs. The operation was March 20, 1911. Various growths were removed, and the varicose veins excised. Analgesia was induced by the glucose-epinephrin-stovain, so-called "non-diffusible" solution obtained from Gray, of London, one ampule, 2 c.c., 3 per cent. stovain, being injected. Adjuvant medication consisted of strychnin, 1/60 grain, and nitroglycerin, 1/200 grain. Analgesia extended to the neck, and lasted for one hour and fifty-five minutes. There was no nausea, no vomiting, no headache, or other unfavorable symptoms. The patient was cheerful throughout the operation, her facial expression giving no evidence of pain or distress. Recovery was uneventful.

The only death which I have to chronicle in my 1,065 cases occurred when the Babcock "diffusible" solution was employed. It may be stated in advance, however, that the fatality is not necessarily attributable to this agent.

STOVAIN-ALCOHOL-WATER (DIFFUSIBLE)

CASE 4.—The patient, a male child, aged 2, on my service at Randall's Island, New York City Children's Hospital and School, was in very poor general condition, with chronic bronchitis, some dulness in the chest and distressing inflammation and prolapse of the rectum. Operation was definitely indicated, and inhalation anesthesia was positively contraindicated. It seemed justifiable, therefore, to attempt to relieve the condition by operation under spinal analgesia. An injection of 0.5 c.c. of the Babcock diffusible stovain solution was employed. The child died almost immediately after the injection was made. Autopsy was not allowed, but from the apparent slight enlargement of the thymus gland which was present, the dulness in the chest, and the general appearance of the child, it may be that death was due to that more or less mysterious condition known as status lymphaticus. We may give the diffusible solution the benefit of the doubt.

The following case illustrates the successful application of the method by means of the diffusible solution:

CASE 5.—J. R., female, aged 50, was received at Randall's Island. Operation, Dec. 14, 1911, consisted of panhysterectomy for fibroid tumors of uterus and cystic ovaries, the incision and suture of "Lane's bands" and appendectomy. Preliminary medication consisted of 1/4 grain morphin

2. Bainbridge: Med. Rec., New York, 1900, lviii, 937.

and 1/200 grain atropin hypodermically half an hour before operation. Spinal puncture was made in median line between first and second lumbar vertebræ; 3 c.c. of stovain-alcohol solution injected, at 10:15. Analgesia was complete to nipple line at 10:19. Median abdominal incision was made at 10:25; patient experienced no pain or discomfort. Exploration revealed three distinct peritoneal bands, narrowing the lumen of the ileum and causing marked angulation at the crest of the pelvis. These were sectioned and sutured, and the appendix removed. This part of the operation was completed by 10:45, and panhysterectomy begun. At 11 o'clock the patient complained of discomfort due to the stretching of the abdominal wound, but cutting, suturing or clamping the tissues caused no pain. Her condition at this time was excellent. At 11:30 patient asked for a drink of water, which was given her, with a small quantity of whisky. Respiration and pulse were regular, and the expression of the face revealed no real discomfort. There was no nausea, no vomiting and no coughing at any time during the operation. The color of the skin remained good throughout. Operation was completed and abdominal wound closed at 12 noon. Patient left table at 12:05, talking quietly, and in excellent condition. Analgesia persisted for one hour after completion of the operation. At no time did the patient's temperature rise above 101 degrees F. There were no postoperative complications, recovery was uneventful, and at the end of the third week the patient was walking around the ward perfectly well.

The patient in this instance was an ideal illustration of the field for spinal analgesia. She was old beyond her years, with some thickening of the arterial walls, with abnormally small kidneys, excreting urine of low specific gravity, with some albumin and casts. There was no postoperative interference with the action of the kidneys, such as would very probably have occurred after the administration of ether.

With certain notable exceptions, both the experimental and the clinical investigations of the early period of the evolution of spinal analgesia were concerned with the production of analgesia below the diaphragm, and its application to the surgery of these regions. It is not to be wondered at, however, that the advocates of the method were unwilling, in many cases, to rest with this limited field of application to the lower parts of the body, and that they began to extend it to the parts of the body above the diaphragm.

Tait and Caglieri of San Francisco, Morton of the same place, Chaput of France, and others, performed operations on various parts of the body above the level of the diaphragm, as early as 1900, thus antedating this particular part of the work of Jonnesco of Bucharest, by about eight years. Tait and Caglieri, in 1900, reported three cases in which cocain was injected into the sixth cervical space, without untoward effects. The patients were examined weeks after the injection and found to be free from any complication. Similar results were obtained by others.

So far as I have been able to ascertain, the work of Tait and Caglieri, Morton, Chaput and others, with high injection, has not been followed up with further clinical applications, and for this reason, perhaps, originality in this regard has been generally accorded to Jonnesco. The "new method" of spinal analgesia reported by Jonnesco in 1908 consists in piercing the spinal column at all levels, according to the operation, and injecting stovain, novocain, or tropacocain, with strychnin, into the subarachnoid space. As is well known, Jonnesco considers the fact that the respiratory nerves are not involved in the high injections as due to the influence of the strychnin.

I have never employed the high-injection method of Jonnesco, in either the original or the modified form (in which he confines the injection to the superior dorsal and the dorsolumbar sites). I have been able, however, in some instances, to operate on practically any portion of the body under spinal analgesia as induced by the various solutions, plus the head-high or the head-low position of the patient. Years ago I used strychnin and glonoin hypodermatically as supportive and corrective medication at the time of the spinal injection. The only thing new in Jonnesco's method, so far as strychnin is concerned, is injecting this drug, with the analgesic agent, into the canal.

The evolution of spinal analgesia was not completed with the discovery of less harmful agents as suggested by Bier. With the perfection of combinations of the analgesic agents with other substances, giving a more or less diffusible solution and a consequently more or less controllable analgesia, and with the extension of the application of the method to the upper part of the body, the indications and contra-indications for the method have also been carefully studied, and no inconsequent part of its development is concerned with the widening of the scope of spinal analgesia.

One of the most telling illustrations of this increased sphere of application is its use with children. In the earlier days of spinal analgesia perhaps the majority of writers on the subject named infancy and childhood among the contra-indications. Even now many advocates of the method do not approve of its use in this class of patients.

In the early stage of the application of spinal analgesia I began to employ the method, being particularly interested at that time in its use in young children. Several cases of children operated on under spinal analgesia were reported by me,[3] the youngest being 2½, the oldest 11 years old. The former patient was apparently the youngest on whom the method had been employed at that time. I reported an additional series of forty cases,[4] twenty-four of which were given in detail, the youngest being 7½ and the oldest 19 years of age. In July of the same year I reported twelve operations[5] on infants and young children, the youngest of this series being 3 months and the oldest 5 years of age.

Since that time a large number of children have been operated on by various surgeons, the most notable series of cases being that reported by H. Tyrrell Gray, of the Hospital for Sick Children, London. He employed the method in all abdominal work on children, holding that when it is used the mortality record in such cases is materially lowered.

Along with the perfection of the method in the matter of agents, sites for injection, scope of application, etc., there was much to be evolved with reference to the preliminary preparation of the patient, the selection of the analgesic agent best suited for the given case, the careful estimation of the dose required for the individual patient and the actual technic of injection.

As the method has been developed, various needles and syringes for the injection have been devised, and the technic has been varied to suit the ideas of the individual operator. Time does not permit, nor is it necessary, to detail the different modifications of the method. The technic which has answered my needs best is given below.

PRELIMINARY PREPARATION OF PATIENT

Preliminary preparation of the patient as regards diet, catharsis, etc., which is of so great importance in

3. Med. Rec., New York, Dec. 15, 1900.
4. Med. News, May 4, 1901.
5. Arch. Pediat., July, 1901.

inhalation anesthesia, is not so essential in spinal analgesia, except in operations on the intestines. In a certain percentage of cases incontinence of urine and feces occurs from relaxed sphincters, when rectum and bladder have not been emptied. Patients coming into the hospital from the street, with no preliminary preparation, have been operated on as successfully, and with as few accompanying and postoperative phenomena, as have those who have been subjected to the most careful preparatory care. Generally speaking, however, attention to all details which conserve the patient's vitality and comfort should be observed.

A hypodermic injection of morphin (⅛ to ¼ grain), combined in some cases with atropin or scopolamin, may be given half an hour before spinal puncture. It serves to tranquilize the patient and to make him less susceptible to any possible pain or discomfort contingent on the initial procedure. Bromids instead of morphin may be given the day before, or nitroglycerin (1/200 to 1/100 grain) may be advantageous, administered at the time of injection. Strychnin (1/60 grain) given subcutaneously at the time of the spinal injection is supportive. Combined with nitroglycerin it lessens the danger of headache, shock and other disagreeable symptoms.

No preliminary medication is given to children.

APPARATUS

The apparatus for giving the injection of the analgesic agent consists of a syringe and two cannulas.

The syringe, which is made by Ford and Company or the Kny-Scheerer Company of New York, is entirely of metal, including the piston, so that it expands uniformly on boiling. It has a capacity of 5 c.c., the corresponding quantities in the two systems being graduated on the piston.

The cannulas are made in two sizes, of three lengths. The points are ground short and beveled, with a cutting-edge all round. The shank is of flexible metal, so that it will bend without breaking. The cannula slips on a ground joint, fitting accurately the handle, without washers or screws. The proximal end is fitted with a handle which can be firmly grasped. Through the cannula runs a stylet, the proximal end of which is rounded, knob-like, so that it can be pressed against the base of the index finger, adding firmness of grip.

The entire instrument can be taken apart and thoroughly sterilized.

TECHNIC OF INJECTION

The usual aseptic precautions are observed. The site of puncture may be cleansed in the usual way, by scrubbing, etc., or by painting the skin with tincture of iodin. The patient, in the sitting posture, the feet hanging over the side of the table, with the puncture site painted with iodin, is draped with a sterilized sheet. This sheet has cut in it a hole or window large enough for purposes of injection. The operator, in making his examination and identification of landmarks, runs no risk of contaminating his hands by contact with skin surfaces which have not been rendered aseptic.

The site of puncture is now determined in the following manner:

1. The highest points on the crests of the ilia are located. On this level is the spinous process of the fourth lumbar vertebra.

2. The sites of the second, third, fourth and fifth lumbar vertebræ are marked.

3. The thumb is placed in the space between the twelfth dorsal and first lumbar, second and third, third and fourth, or fourth and fifth lumbar vertebræ, according to the selection of site, at the mid-point between the two. One-half inch to either side of this is the site for the puncture. I usually inject between the fourth and fifth or third and fourth lumbar vertebræ.

The puncture-point being located, the assistant plays a spray of ethyl chlorid on the area, or, if preferred, a preliminary subcutaneous injection of cocain or other local analgesic agent may be given. A small incision is now made through the true skin, which may be rendered hemostatic as well as analgesic by the ethyl chlorid.

The needle is passed through the incised skin and subcutaneous tissue, straight forward. The head is then depressed, the point being made to go upward, forward and inward toward the median line. It is inserted from 1½ to 2½ inches, according to the thickness of the patient's body.

When the needle is felt to impinge on the bone surrounding the foramen, it is depressed a little more and pushed forward, when it comes on the ligamentum subflavum, then the dura mater. In piercing the ligament and dura there is a peculiar sensation like the "popping" of a membrane. This signifies the entrance to the subarachnoid space.

The cerebrospinal fluid escapes under ordinary circumstances. If it does not flow freely something is wrong. The needle may not have entered the right place, or it may be clogged. A stylet should not be inserted into the needle. Another syringe should be ready, and with this, if one cannot draw out blood or fluid, the needle should be withdrawn entirely and then, after being rendered patent, reinserted. I prefer not to proceed with the injection unless the fluid issues with at least an approximate quantity and tension. Others, notably Gray,[6] are not agreed on this point, being willing to proceed with the injection when the fluid issues only in slow drops, or when it is slightly blood-stained.

In some cases, despite careful technic and repeated attempts at different sites, no cerebrospinal fluid is obtainable. Such cases have doubtless led to the expression "dry spine," but it is rather to be inferred that they come under the category mentioned by Gerstenberg and Hein,[7] Lusk[8] and others, in which the arachnoid membrane is adherent to the posterior surface of the cord at the levels entered, so that no fluid is obtained for the reason that, at the given locality, the subarachnoid space is obliterated posteriorly. I have had one such personal experience. Despite four attempts, in each of which the canal was entered, two between the fourth and fifth, one between the third and fourth, and one between the second and third lumbar vertebræ, no fluid was obtained. The attempt was then abandoned and the operation (appendectomy) successfully performed under ether anesthesia.

The analgesic solution is now injected slowly. The obliquity of the passage of the needle has the advantage that no tract is formed for the fluid to follow as the needle is withdrawn. The body of the vertebræ in front should not be touched with the needle, because of the presence there of a large plexus of blood-vessels. When the needle is withdrawn a cotton and collodion dressing is applied.

If low analgesia is desired for operations on the lower part of the body, the patient should be allowed to sit up for a few minutes after the injection, or the head should

6. Gray: Lancet, London, Sept. 25 and Oct. 2, 1909.
7. Gerstenberg and Hein: Ztschr. f. Geburtsh. u. Gynäk., 1907-1908, lxi, 524; also Verhandl. d. Gesellsch. f. Geburtsh. u. Gynäk. zu Berlin, 1907-1908.
8. Lusk: Ann. Surg., October, 1911.

be elevated, when solutions of the same or heavier specific weight than the cerebrospinal fluid are used. If the lighter fluid is employed, it must be borne in mind that the head must be lowered *at once* after the injection to prevent the rapid diffusion of the analgesic agent and the danger of death from respiratory paralysis. When high analgesia is desired, for operations on the upper parts of the body, the patient may be placed in a more or less marked Trendelenburg position, with the heavier solutions. The "diffusible" solution may be used if, after the initial lowering of the head, the head of the table is slowly and carefully elevated. My own feeling is that operations on the head and neck should not be undertaken under spinal analgesia unless other methods are absolutely contra-indicated and operation is essential.

SUMMARY

From the weight of conflicting testimony with reference to the indications and contra-indications for spinal analgesia, it may be deduced, in a general way, that, granting the need of operation and the impracticability of local or regional analgesia, *the indications for spinal analgesia are the contra-indications for inhalation anesthesia.* So far as the character of the operative procedure is concerned, there are practically no contra-indications to the employment of spinal analgesia. A person already in marked shock or profoundly septic should not be subjected to this procedure. A number of surgeons with wide experience accept practically no limitations to its use. Some operators firmly believe that in certain cases this method is safest and best.

The real objections to spinal analgesia in my opinion are:

1. The operator is absolutely committed to the dose, whatever it be. It can be increased by an additional injection, but it cannot be decreased once given. With the changes in the position of the patient, with carefully graded dosage, control can be exercised.

2. In prolonged operations the analgesic effect may pass before the surgical procedure is finished. In some cases, as in laparotomy, it is quite inconvenient to turn the patient over for another injection.

It would be safe to assume that even its most enthusiastic adherents would not advocate the usual employment of spinal analgesia by the surgical novice. It must, therefore, continue to occupy a somewhat limited sphere until further accurate and scientific experimentation has led to more certain conclusions with reference to the physiologic action of the agents employed and the dosage in which they may be used to obtain a given result. Until such information is definitely in hand, spinal analgesia should be employed, as a rule, only by those experienced with the method and having careful technic.

34 Grammercy Park.

ABSTRACT OF DISCUSSION

ON PAPERS OF DRS. BASKERVILLE, ALLEN, GWATHMEY, MILLER, LUMBARD, TETER AND BAINBRIDGE

DR. F. J. COTTON, Boston: The question of doing better work in anesthesia is largely one not of diminishing the deaths "on the table," but of diminishing those indirectly due to the anesthetic. There are, for instance, the deaths from ether from lung complications. It was a short series of deaths from that source that made me take up nitrous oxid-oxygen anesthesia. As Dr. Teter has said, it is the anesthetic of choice for routine work, when it can be administered by experts. Both this and spinal anesthesia are expert propositions; they will not become surgical routines for big hospital clinics. That, however, is no reason against their use where we can have our own way.

I have not had a large experience with spinal anesthesia; I think that proper administration makes it safe and satisfactory. I have had it given a good many times by Dr. Allen and Dr. Richardson, of Boston, and have found it satisfactory. The cases in which it seems to me that it would not be satisfactory to use any other form of anesthesia are those of diabetic gangrene and those of seriously damaged kidneys. These patients do better under spinal anesthesia, and I have been afraid to use nitrous oxid on them. The objection to spinal anesthesia, in addition to the fact that it requires an expert to administer it, is twofold: first, on the part of the patient; and secondly, on that of the surgeon. First, there are patients on whom it cannot be comfortably used; even if one anesthetize such a patient at the head, by talking to him, he is more or less nervous. Second, it takes long practice to do work with any kind of anesthesia when consciousness on the part of the patient is not abolished. To do good work under such conditions takes a rather callous temperament or long practice. There is great convenience in having a visible supply of gas. Oxygen is the only gas of which it is important to have a visible measure, but it is convenient to have a visible supply of both. Some form of bubbling arrangement is necessary—to enable one to see whether the oxygen is flowing. The development of cyanosis is so prompt under nitrous oxid and oxygen that if there is any hitch, there is trouble very soon. Anything that gives information on this point is rather worth while. Dr. Teter has not spoken of the furthering of an even flow by working from low pressure. This advantage is commonly accepted to-day, though it is relatively new in the handling of this anesthetic method.

PROF. YANDELL HENDERSON, New Haven, Conn.: I urged yesterday in the House of Delegates (and it seems to me that the matter of statistics tends to bear out the point) that deaths under anesthesia are not really due to anesthetics, but to anesthetists. That is, if we are going to diminish the deaths under anesthesia, we must have capable anesthetists—I am not giving an expression of opinion one way or another as between nurses and interns. The principal point that the Committee on Anesthesia urged was that everything should be done that can be done to recognize anesthetists—to have a department of anesthesia for every large hospital and to put it under the control of the attending anesthetist, as the medical or surgical work is under the control of the attendant in medicine or surgery. This work should be managed by the attending anesthetist, just as it is by Dr. Allen at the Massachusetts General Hospital. This is of the utmost importance. Dr. Teter spoke of the quantity of carbon dioxid that is allowable. In an early paper, I set the limit at 5 per cent. That is too low, but there were not sufficient data at that time to enable us to know how much would be safe. It is clear now that it is quite safe to go to 10 per cent., and very likely 15 would not be dangerous.

The New York Society of Anesthetists, which was organized last winter, has been the means of bringing the anesthetists in the neighborhood of New York into personal contact, which is important for their mutual advantage and the advancement of anesthesia; and they have felt that it would be well to have a national society of anesthetists. It seems to me that to bring the anesthetists all over the country into contact and give them a feeling of solidarity, so that they may work together and insist on their rights, is most necessary.

DR. W. WAYNE BABCOCK, Philadelphia: My experience in spinal anesthesia does not date back so far as Dr. Bainbridge's; but eight years ago, I began to use spinal anesthesia and since then I have employed it in nearly all cases in which the operation was below the level of the nipple, except when the patient or the family physician expressed a prejudice. I began with heavy solutions and found difficulty in securing uniform anesthesia. Gradually, I worked away from the heavier solutions and used the lighter, and found that the range of the anesthesia became greater. Finally, by adding alcohol to reduce the specific gravity, I found I could produce

an anesthesia that would involve any part of the body, even to the top of the head. The specific gravity of the anesthetic being less than water, if the patient sat erect it would soon rise to the upper cord. This fact involved certain dangers, and I soon discarded the high anesthesia, and as a rule limited the use of the anesthetic to operations below the nipple. There is an apparent general misconception as to the nature of spinal anesthesia; it is not a cord anesthesia, but a nerve-root anesthesia. Therefore, with higher injections, the patient may be completely paralyzed in the upper part of the body, but still capable of using the legs, and with tactile and other senses preserved in the feet, showing that the conducting paths in the cord functionate although certain nerve-roots are involved. This is important, as when the anesthesia is rather high, paralysis of the nerves controlling the diaphragm results in the abolition of diaphragmatic breathing. As this occurs, the chief muscles of the chest having been thrown out of function, the patient may by accessory muscles make ineffective efforts toward respiration. If such a patient be left alone, he will die; but if artificial respiration be instituted, even though the dose of the spinal injection be large, the patient will again start breathing, although perhaps not for fifteen or twenty minutes. The anesthetic has little influence on the heart, and by artificial respiration the patient may be kept alive, even after tremendous doses of the anesthetic.

Spinal anesthesia is contra-indicated in conditions that prevent the efficient use of methods of artificial respiration. It is especially useful in heart disease and in the other conditions described by Dr. Bainbridge. In regard to the objections, first that the patient is conscious, Dr. Bainbridge has shown how patients may almost enjoy the operation. Some, indeed, do seem to enjoy it. Those who are nervous, on the other hand, may readily have their higher centers abolished by injections of scopolamin and morphin. There is more and more a tendency to use narcotics, so that the patient comes down to the operating-room in a "twilight sleep."

DR. R. C. COBURN, New York: Clover was the originator of the beneficial method of rebreathing, but it was on a very unscientific basis until the work of Henderson, who presented it in such a light that it is now susceptible of almost universal application. I strongly disagree with one of the speakers, who said that nitrous oxid is administered by rebreathing on account of the money that this saves, and that there is no principle involved that renders it safer, such as the matter of the increased carbon dioxid in rebreathing. While it is true that under nitrous oxid anesthesia there is less shock than under any other form, and that the anesthetic *per se* does not produce shock, yet under its influence there is a smaller amount of carbon dioxid in the blood, and therefore, a greater call for its retention than with any other anesthetic. As a corroboration of Henderson's theory as to the effect of the retained carbon dioxid in the administration of anesthetics, I want to cite personal observation that in abdominal operations in which the viscera are exposed and there is opportunity for the carbon dioxid to transpire into the surrounding air, the patient will tolerate a double amount of rebreathing, i. e., twice as much as in other conditions in which there is little exposure of the capillary blood-vessels.

A point in the administration of ether that corroborates this is that when a patient is under a light anesthesia, the shock is greater than under deep anesthesia, especially in abdominal operations. It is my experience that in the administration of ether, when one uses an extra amount of rebreathing, keeping the carbon dioxid at normal or more, the patients will undergo operations under light anesthesia with practically no shock. I believe that this is due to the increased carbon dioxid provided through the extra amount of rebreathing. In abdominal operations, in which this observation has been especially made, the carbon dioxid has the opportunity of transfusing into the surrounding air; and it is much lower in such operations than in those in which there is no such opportunity for the carbon dioxid to pass off into the air. While it is true that rebreathing in the administration of nitrous oxid reduces very materially its cost, I am quite sure that it is not the proper reason to give; and I am quite sure that the men who have been primarily engaged in the production and the promotion of nitrous oxid anesthesia with rebreathing have not placed their work on that basis.

PROF. YANDELL HENDERSON, New Haven, Conn.: I did not say what Dr. Coburn thinks I did. What I said was that the method of rebreathing started as a question of cost. I would say that we have no exact measure of rebreathing in the individual patient, and until we have some clinical measure of rebreathing, it is not on an exact basis.

DR. ROBERT H. FERGUSON, East Orange, N. J.: While I use the open-drop method almost exclusively in my work, I now merely call attention to my belief that about 92 per cent. of all the ether anesthesias in the United States are by the open-drop method. This opinion is formed from a careful scrutiny of all the statistics I can get, together with personal observations made in many hospitals in over 75 per cent. of the states of the Union. Further, I believe that when anesthesias by this method have not been so good as were desired, the failure has been due to unskilful administration, perhaps aided by an improperly arranged apparatus, rather than to the method itself. A point, then, I wish to make is this, that instead of endeavoring to bring out new apparatus and multiplying methods we ought to concentrate our attention on one simple procedure, such as the open-drop method, and perfect it. After its range of usefulness is determined it will be right to study exhaustively another method, if the first is unsatisfactory. Experimentation in anesthesia ought, however, to be of the most conservative kind, since the safety and comfort of the patient is involved. To a mind impressed with such a necessity, the little advance made in a simple method of administering ether during the last twenty-five years is a matter of regret.

As regards anesthetic statistics, we should be very patient, not content with a small number, with those of one locality only or with any of a doubtful or limited value. Dr. Cotton has suggested that the majority of our anesthetic statistics are of small value. I believe that such is the fact chiefly because they are not complete. As an illustration let me say that it has been my duty, from time to time, to investigate so-called anesthetic deaths in various parts of the United States. Often, when my attention has been called to one death, I have found nine or ten in that vicinity. Again, while on the train, coming to this meeting a surgeon told me that the hospital with which he was connected averaged five chloroform deaths a year although his patients always had ether. I could give other illustrations. Now practically none of these deaths are reported in print. Some were mentioned at meetings of local societies but were you or I collecting data for statistics of anesthetic deaths none of these cases would be available. I think these facts are strikingly conclusive of the untrustworthiness of our anesthetic statistics. I wish that every hospital and every surgeon would realize the importance of putting on permanent available record every death, directly or indirectly due to the anesthetic, together with full details of the case.

DR. T. D. BUCHANAN, New York: I want to report without pride two unsuccessful cases, merely as a warning and possibly a help to some of you, as surgeons or anesthetists, in diagnosing the same thing that I ran across. After fifteen years of specializing in anesthesia in New York City without any deaths, I came across two cases in two weeks and lost both patients, one under ether, and one under gas and oxygen. Both patients had enormous fibroid tumors of the uterus, both were pretty well exsanguinated by frequent hemorrhages, and both died very suddenly in the midst of the operation. Now statistics with regard to deaths on the table are very hard to get. The causes of the deaths of this sort in the hospitals with which I have been connected were hard to find. Each time that I went to investigate one, the surgeon would say that it was an anesthetic death, and the anesthetist would say that it was caused by shock. That is why we cannot get statistics. In my own cases of fibroid,

the deaths were due solely to the anesthetic. I make this excuse for myself, however: that in a number of fibroid cases there is fibroid degeneration, not only of the uterus, but of other parts and tissues of the body, and frequently of the heart. There are numerous authorities for that statement, and I believe that this is what I encountered. I have known other deaths to occur following fibroid operations, ten or twelve hours afterward, but not on the table. The first case might have been due to my not paying attention to the anesthetic, but the second surely could not have been, because I had just had a warning a week before from the other fibroid case, and was watching every second. The second death, as I have said, occurred under nitrous oxid and oxygen. We should have a very wholesome respect for these cases, and not keep the patients in the Trendelenburg position longer than necessary; and the anesthetist and surgeon should avoid throwing even the slightest strain on the heart.

DR. A. F. ERDMANN, Brooklyn, N. Y.: I take this opportunity of thanking some whose names I cannot recall for sending to me the sample anesthetic charts for the society and other libraries. I have a collection of nearly a hundred; some of them are certainly queer. Three or four are very long, a number are very short; some contain only few details, others have space for numerous data; most of them omit important matter, so valuable that I cannot see of what use they really are. As a matter of fact, few charts are properly kept, mainly, I believe, because the intern realizes that pulse-rate, amount of anesthetic used and length of time of operation tell practically nothing of the course of his labor. May I suggest that we go over our charts again to see if there is not something to add to them that will make them more interesting to yourself or to some one else, and which will give them a value for those who like Dr. Gwathmey are endeavoring to gain knowledge of this subject for the common good? Until we use good charts and have them kept conscientiously we cannot expect to be able to gather reliable statistics.

DR. F. R. WIDDOWSON, Philadelphia: Dr. Buchanan, in his discussion, brought up the subject of statistics. I suppose, if he has had experience in looking up statistics of this character in a hospital, he has found them to be of little value, owing to the way in which these records are usually kept. I think that the reason why Dr. Gwathmey failed to get reports from many hospitals was their inability to render a report of value from the imperfect records. If a hospital does not have a form, as Dr. Erdmann has just said, on which the anesthetist can record the data concerning the administration of an anesthetic, the records regarding anesthesia will be very meager. For those who teach and have charge of the anesthetic work in hospitals, the first thing is to have a "form" on which data are collected systematically. If the administrator knows he has to make a record of these things on a chart, he will attend to his work in a more systematic manner, think of the different points, and derive more benefit therefrom. I would say to the surgeons and anesthetists here: One of the best things you can do is to have an official chart made for your hospital when you return. If you have one, you can improve on it, getting additional data. Then when Dr. Gwathmey or some other anesthetist tries to get statistics, he will be able to get them satisfactory to himself and to you, and it will be a pleasure, for the hospital asked, to give them.

DR. FRANK W. PINNEO, Newark, N. J.: There are four principal elements necessary for the success of insufflation anesthesia, which the report of the Committee on Anesthesia recognizes; that is, first, the warming of the vapor in the insufflation apparatus. The three other factors are maintenance of a steady air-pressure; a cock on the apparatus to determine and govern the delivery of vapor to the patient, and a catch-bottle to make it impossible for any liquid ether to be carried over to the patient. We ought not to think nitrous oxid and oxygen useless because some ether has to be added and where such an exponent of it appreciates the little ether added it helps to broaden the field for nitrous oxid and multiply its users. Dr. Gwathmey also has pointed out the value of nitrous oxid, which is, as Hewitt said, "the safest anesthetic known." There is a contra-indication to its use in children under 5 years of age, but here straight ether is usually good, or, in competent hands, with caution, we may be able to use chloroform for induction (never after an initial period of "ether excitement").

DR. F. K. REAM, Chicago: I have been administering nitrous oxid and oxygen for over twenty years for the extraction of teeth. This particular work led me to engage in hospital practice, and my work is largely limited to that now. I have so completely covered the ground of the use of the various methods that I am really apparatus-poor, having purchased most of the outfits on the market; my experience has led me to the selection of two methods. My method of choice is the Teter, using large nitrous oxid and oxygen tanks with continuous, uniform pressure, making it possible to obtain intrapulmonary pressure, as recommended by Dr. Teter. I cannot with any other method on the market obtain relaxation and control my patients without ether, as I can with the intrapulmonary pressure. I consider all other methods substitutes. I think that Dr. Teter's methods and research have done more to eliminate and limit the use of chloroform and ether than those of any living member of the profession.

I have recently had a series of cases in which I used Dr. Coburn's apparatus for a mixed anesthetic and rebreathing. In some of these, I did not use any ether whatever, and obtained splendid relaxation. In cases in which that is possible, the patients, I believe, must be susceptible to anesthesia in order to bring about that condition, but I am satisfied that I can obtain very much more relaxation from nitrous oxid and oxygen under pressure.

DR. J. W. HEIM, Louisville: I disagree with the man who recommended the chloroform-ether sequence for children to whom we do not wish to give chloroform straight. I think that is the most dangerous form of anesthesia. If in giving an anesthetic the beginning is the most dangerous, why should we use chloroform, which is the most dangerous anesthetic, at the most dangerous time? I would rather induce the anesthesia with ether.

DR. W. S. BAINBRIDGE, New York: First, the early mortality from spinal anesthesia cannot, I think, be attributed to cocain, but to the excessive dosage of cocain employed and the wrong technic. From my own experience, I have learned that stovain and tropacocain are the spinal anesthetics of choice. Still, cocain has been uniformly of value in my cases. The only new thing about Jonnesco's method was that he put strychnin with his analgesic drug into the cord. Stovain had been used before; the high puncture was not new; strychnin had been used by others. In 1901, I was personally employing strychnin under the skin to offset any bad effects of cocain in the subarachnoid injection.

By using cocain low in the cord, I have been able to do operations on the top of the head and have had a number of cases of total analgesia. I thoroughly believe that there is such a thing as preanesthetic anticipatory shock, and the person who says to a patient about to take any anesthetic, "Look what is going to happen," is giving him a certain amount of shock, with which the anesthetic has no right to be saddled. Whenever possible, the mind as well as other organs of the patient should be properly prepared for any anesthesia. I think that it is a safeguard to the patient for the surgeon to watch what he is doing. There is likely to be less shock from unnecessary handling of the tissues when the patient is conscious.

I have had children as young as three months sucking the bottle while the operation for incarcerated hernia was going on, and only stopping their sucking of the bottle with a good, ravenous appetite, to give a cough indicating the general bronchitis that was present. Waugh and Lane assert that the use of spinal anesthesia in acute abdominal conditions in children reduced the mortality about 20 per cent.

DR. CHARLES K. TETER, Cleveland: What is the prevailing impurity usually found in nitrous oxid? I have had reported to me within a month two fatal cases in which nitrous oxid and oxygen were used, death being due to impure gas. There are such peculiar symptoms manifested in such cases

that the cause cannot be overlooked. The patients have a very peculiar greenish-red color, and the blood seems almost of a rusty hue. Dr. Clifford U. Collins, of Peoria, Ill., reported a fatal case with these symptoms within the last month. I have had two cases in which these symptoms arose, and in both I found that my gases were impure. I did not have the opportunity to have the gas analyzed, in order to find out what particular impurity produced the condition. The patients were quite sick for a day or two, but recovered. I think that the impurity was probably nitric oxid.

It has been said lately that all that was necessary to make the present nitrous oxid and oxygen apparatus an automobile was the addition of a carburator. If nitrous oxid is the agent used to induce and maintain anesthesia and not as a makebelieve, a more or less complicated apparatus is essential. At present it may be admitted that in the way nitrous oxid is administered by a good many people, it is not the anesthetic. They are really using the closed method of ether, giving 3 or 4 ounces of ether in an hour, but calling it nitrous oxid anesthesia. It requires only an inhaler and a bag and a couple of cylinders to do this; but if one depends on nitrous oxid and oxygen, only using the oxygen to eliminate the asphyxia, one must have more apparatus and also some sense to know how to employ it. I have seen some men give anesthetics who, if they had to pass as stringent an examination in regard to the subject of anesthesia, as a chauffeur has to pass in his examination, would fail.

One must use common sense in employing positive pressure. If it is used to such an extent that stress is thrown on the respiratory mechanism, one is using too much. If there is strain, one should change the pressure. There should be no strain. In the average case, if one uses 6 to 8 mm. of mercury pressure, it will not hamper respiration in the least. If this is too much, the pressure should be released. The reducing of pressure in a cylinder is important in securing a perfectly even flow of the gases.

DR. A. H. MILLER, Providence, R. I.: It is a fact that there have been no reliable statistics of the mortality from anesthetics available, but I do not believe that this should be. I believe that we can get valuable statistics of the mortality from anesthetics. In the first place, we must separate the deaths that occur as the result entirely of the anesthetics from those in which the anesthetic contributed to the fatal result, and from those in which it had no effect in producing the mortality.

DR. JAMES T. GWATHMEY, New York: The statistics, as given this afternoon, are certainly reliable, and more reliable than any heretofore taken. Indeed, they are more reliable and of more consequence to us, for they represent the results of statistics as given in the United States to-day. Dr. Cotton, in his discussion, stated that he doubted their value, because he knew that many unreported deaths occurred under anesthesia, and also that postoperative deaths are probably not reported in these statistics. It is a question whether any postoperative deaths are reported, yet we know that they do occur after all anesthetics. In the last month, I know of a case (a laparotomy) in which a local anesthetic was used. The operation was successful, and a large tumor was removed; the patient died a few days afterward, from pneumonia. The question is so complicated that if we go into the matter of collecting reports of deaths after operation, it is doubtful whether, even if we had the statistics of all postoperative deaths, they would be as reliable as the statistics we have that can be compared with similar ones already in existence. We know that anesthetic statistics are recorded in but few hospitals of America to-day. The fact that I sent out circulars to the hospitals started many of them in the work of compiling statistics; and I would suggest that if it is known that statistics are being asked for they will be more careful in the future.

Anesthetics are in a state of evolution. There is no one accepted method of anesthesia. As to the question of whether local, spinal, morphin or pulmonary anesthesia alone or in combination is the best method, no one can say positively. Therefore, I should like anyone who is connected with a hospital that has not given statistics, to assist me by asking for a circular to fill in. This report will be the first that has been made of reliable statistics in America.

PROF. CHARLES BASKERVILLE, New York: As to the different prices of ethers, I would say that I make it a rule to pass on the quality, without inquiring about the price. It is immaterial what the price is. That involves a problem of manufacture, which is not generally known, outside of what I have presented in the paper. Some manufacturers make one grade of ether—anesthetic ether, they call it. Some make just "ether"—chemically pure ether (which is infinitely purer than the anesthetic ether), anesthetic ether, commercial ether. Ether may be thus of three kinds, and they may all be made in one way. You know the class of labor that many manufacturers employ; and when they get to the packing, there is danger of mixing these ethers. I have had some cases of that kind. It might have been an accident, but it happened. Some manufacturers of ether prepare only one grade, anesthetic ether, and some manufacturers who make the different grades can afford to sell commercial ether at a low price. They then rectify a little of that, so as to get just enough to keep their trade in the anesthetic grade. It is a perfectly good ether; but if nothing was paid for it, they would lose nothing. Every cent that they get for that is net profit. It costs them nothing to produce it.

The truth is that when we gather statistics we do so for two purposes. One of these is the matter of curiosity. That is all statistics show in one way. The other object is to learn something; and what we want to learn is how to get over the troubles that we have been having. I am convinced that each drug has its specific action and the processes that go on in the human body are the same as those that we control in the laboratory; and that is the whole field of medicine. If we can learn to control the different reactions, we have the problem solved. That is one thing about getting an anesthetic into the system. Of course, I realize that it is dangerous for a chemist to trespass in a field of that kind, but I shall be out of town soon. The anesthetic ought to be sent in approximately at the temperature of the body. It should also be sent in approximately at normal humidity, and both of these have been accomplished by means of vapor anesthesia, whether nitrous oxid or other kinds, if passed through water.

An improvement on Dr. Gwathmey's method is that of Dr. Davis, which consists in saturating vapor with water and warming it afterward, so that it enters with a degree of humidity of 60 or 70 per cent.

ANESTHESIA BY PHARYNGEAL INSUFFLATION *

FRANK WILCOX PINNEO, M.D.
NEWARK, N. J.

The ideal anesthesia includes four factors: (1) an induction, short, tranquil and not unpleasant to the patient; (2) a maintenance, surgical, even, featureless and so absolutely under control that it is but just deep enough each minute for the existing purpose; (3) a recovery, prompt and complete; (4) after-effects, *nil*, i. e., without symptoms, immediate or remote, in any organ, alimentary, respiratory, circulatory or excretory. It is true of every known method that as it approaches this ideal in some respects it recedes in some other; hence the need for adapting the anesthetic and its method of administration to the individual case, choosing the best combination of results attainable.

* Read in the Section on Diseases of Children of the American Medical Association, at the Sixty-Third Annual Session, held at Atlantic City, June, 1912.

In the surgery of childhood — not a new subject, but bound to receive more special attention — we are confronted, in anesthetics, with the pediatric problem of administering to an organism, embryonal in some degree, potent drugs to which it is peculiarly susceptible. Hughes[1] points out in this connection that age and body-weight are as important as in feeding or medication. The same authority shows the fault of a "smothering" induction, that the workable limits of a safe maintenance are very narrow, that under 5 years of age any deprivation of oxygen is badly borne, that liability to surgical shock increases, not diminishes, with deepening anesthesia, and that detection of shock is especially important and not easy. Kelley,[2] of Cleveland, says that prolonged operations are bad for children, and all can confirm this who have watched the vitality wane in one who may have gone through the first half hour very well. Kelley also emphasizes the need of gentleness in manipulation of the delicate tissues of a child, quoting Bloodgood[3] that "rough handling of tissues and hemorrhage" are most productive of shock.

UNIFORM MAINTENANCE OF ANESTHESIA

In the evolution of surgical anesthesia since its beginning with Long, 1842, Wells, 1844, and Morton, 1846, the present age demands, not so much discovery of new anesthetics as refinement of methods and greater accuracy in the use of the materials we have. But this — to be practical and universal — must be accomplished without elaborate apparatus. The report of the Anesthesia Commission of the American Medical Association,[4] just made public in the Handbook of the House of Delegates of this Association, says, "Recent developments in this field afford ground for the hope that we are to-day at the beginning of an epoch of progress in anesthesia unequaled since its original discovery and introduction." The need is for an anesthesia featureless, safe, surgical, yet not more profound than immediately necessary. The maintenance of this state is our chief concern, and is difficult, particularly in operations about the throat and face where anesthetist and surgeon both need the same field. Kocher, in his "Operative Surgery," says, "Even careful surgeons are still confronted with the great difficulty of maintaining the right degree of narcosis during a prolonged operation." The above-mentioned report of the Anesthesia Commission[5] also says:

> As regards ether, the two points to be emphasized especially are that anesthesia should always be induced quickly, and that throughout its entire duration it should be as nearly uniform as possible. It is not the anesthetist who at all times maintains uniformly deep anesthesia whose patient stops breathing. This accident comes particularly to those who administer so irregularly that the patient at times comes nearly out of anesthesia and again is plunged into profound narcosis. . . . Anesthesia is good in proportion as it is uniform. . . . Offenses against this principle occur most frequently in adenoid and tonsil operations. When the death of the patient (usually a child) results, it is assigned either to "heart-disease" or to an "unrecognized condition of status lymphaticus." It is probable that in most cases these deaths are merely the natural result of intermittent anesthesia and of the increased susceptibility induced by fear. Under the ordinary methods the anesthetist and the operator are alternately in control of the patient's nose and mouth.

Packard[6] has compiled a list of twenty-nine deaths from the anesthetic in tonsillectomy, twenty-six of them being from chloroform, none from ether. That this especially concerns children is seen in that twenty-two of twenty-eight patients were 12 years or under, five between 13 and 16, and one, 20 years. That intermittent anesthesia is very deleterious, even deadly, is reported by Yandell Henderson,[7] with confirmation by Carrel in animal operations, showing that renewal of the anesthetic after partial recovery is fraught with much danger. His comment[8] on the case reported (death in stage of ether excitement under tonsillectomy) is:

> The reason that "unsuspected status lymphaticus" is so often invoked after tonsil operations lies less in any connection of the tonsils with the thymus than in the fact that ether is administered intermittently in such operations, and the subject comes part way out of anesthesia.

He thinks that "status lymphaticus" has been made to bear an unreasonable burden of deaths from unexplained causes and adds:

> If anesthetists will only realize that this (interrupting the administration of ether) is a procedure which above all others should be shunned, the number of cases of so-called "status lymphaticus" under anesthesia will, I believe, show a sudden and marked decrease.

Fig. 1. — New regulating dropper (for ether or chloroform), especially designed for gauging the drops of ether in the open method; also supplies a large stream (by turning the screw) for any other method.

The problems are not solved in simply choosing the method. In the preliminary report of the Anesthesia Commission of the American Medical Association, Cunningham and Anderson,[9] giving a summary on the closed method of ether, cite as a disadvantage that the uneven administration (due to intermittent application) trespasses on the safety limit and predisposes to shock.

But in adopting the open method[10] another difficulty confronts us. The same investigators[9] found this so characterized by refrigeration, the evaporation of ether on inhalation extracting so much heat from the lungs (for exhalations are warmed) that, "if refrigeration is a factor in postanesthetic pulmonary complications" or shock, the open, or drop, method must head the list, as it extracts most heat from the patient. The semi-open method, as with the Allis inhaler, is a compromise between the closed and open method, standing nearer one or the other according to the freedom of air admitted or amount of rebreathing allowed. That it must have

1. Hughes: Kirmisson's Surgery of Children, p. 803.
2. Kelley: Surgical Diseases of Children, pp. 41 and 48.
3. Bloodgood: Bryant and Buck's American Practice of Surgery, ix, 478.
4. Report of Committee on Anesthesia, THE JOURNAL A. M. A., June 15, 1912, p. 1908.
5. Ibid., p. 1909.
6. Packard, Francis R.: Adenoid Operations, THE JOURNAL A. M. A., Aug. 28, 1909, p. 695.
7. Henderson: Intermittent Ether Anesthesia, Tr. Am. Surg. Assn., 1911, p. 231.
8. Henderson: Heart Failure Under Ether, Surg., Gynec. and Obst., August, 1911, p. 164.
9. Cunningham, O. J., and Anderson, H. C.: Methods of Administering Ether, THE JOURNAL A. M. A., Nov. 7, 1908, p. 1574.
10. Herb, I. C.: The Open Method, THE JOURNAL A. M. A., May 6, 1911, p. 1314.

great merit is shown by the great extent of its use and by the tendency, I observe, in even those who think they are using the open method to withhold partially the patient's exhalations by a surrounding towel or even a partial impervious cover over the mask. Again, how many do not drop the ether on but pour it more or less intermittently? If the drop method is chosen the ether should be administered by perfectly regular drops.

A REGULATING DROPPER

To facilitate this I have designed a regulating dropper which may be set at any desired rapidity of drop or stream, is inexpensive and easily inserted in any cork. The best mask has, rather than a thin layer of stockinette, enough layers of gauze, with coarse mesh, to hold some vaporized ether (yet not enough to prevent breathing through it). This diminishes refrigeration and improves the volatilizing of the ether. I am confirmed in my opinion of the value of this by the judgment, in animal operations, of so accurate an observer as Alexis Carrel,[11] who says, "I found that my animals lasted much better if the mask used to etherize had a large dead space so as to involve a considerable amount of rebreathing."

RECTAL AND SPINAL ANESTHESIA

For operations about the head, rectal etherization has been developed,[12] but its field must be very limited and dependent on a skilled anesthetist and careful preliminary preparation of the rectum. It adds rather than removes difficulties. Spinal anesthesia[13] has its field, but the untoward effects during operation and the after-effects, according to Freeman Allen,[14] are such that, in spite of any indications for it in given cases, it can never wholly replace inhalation anesthesia with its adaptability, in depth and control of anesthesia, to the age of patient and kind of operation—an adaptability especially promoted by the use of such means as I propose.

NITROUS OXID-ETHER SEQUENCE

In the search to combine the advantages of different anesthetics, the present age has come, happily, to the use of nitrous oxid preliminary to ether. Such a sequence must be sharply distinguished from mixed anesthetics, such as the A. C. E. mixture, with their uncertainty and danger. Nitrous oxid, especially with oxygen, is most safe. In sequence with ether, as by Gwathmey's apparatus, it affords the advantages for induction and, if the ether following be administered conveniently for head operations, we approach our ideal in maintenance as well as induction. Sequences have come to stay, and statistics prove they are safe. The Pennsylvania Hospital[15] in 11,167 anesthesias had eight deaths, none under sequences but all among the 2,391 straight anesthesias, three under ether, five under ethyl chlorid. Nitrous oxid and oxygen, followed by ether has much to commend it, for with these under instant control by proper apparatus, as Teter's, almost any indication may be met, the ether being, as Crile[16] has shown, an important factor in the administration. The disadvantages he enumerates include the apparatus and experience necessary, the venous congestion and incomplete muscular relaxation; to which might be added the customary hypodermatic of morphin, which in children is contraindicated. In this connection Crile cites a requirement in the administrator, which must appeal to the judgment of everyone having at heart successful anesthesia, namely, a certain personal equipment which affords "the keenest perception of the precise condition of the patient at every moment, i. e., the anesthetist must be a most delicate human recording apparatus."

PRELIMINARY MORPHIN

Bevan[17] and Herb[18] contend against the use, as a routine, of preliminary hypodermatics of morphin or scopolamin. This question has two scientific aspects: (1) that, by its action on the cerebrum, morphin tends to block harmful sensations and, also, that it quiets the respiratory center, thus diminishing danger from acapnia produced by hyperpnea, either voluntary or due to ether excitement; (2) that this very action toward paralysis of respiration removes one of the best safeguards of life, sensitiveness to the stimulation of carbon dioxid (vital, as Henderson[19] has shown) and of ether, and hinders excretion and prompt recovery afterward. Alexis Carrel,[11] at the Rockefeller Institute, says, "I do not give morphin. I use only ether." For our present subject this applies only in so far as it concerns children and the severity and duration of the operation with its need for fortifying the patient against harmful sensations. Crile[20] has well pointed out that there are at work on the nervous system noxious influences which anesthesia does not prevent and suggests means for producing a state of anoci-association (absence of harmful associations). This has its chief application in the handicapped patient, i. e., one whose vitality is seriously impaired, as by infections or severe injury. In the case of children fear is easily overcome by judicious use of our knowledge that they have no natural fear, but that it is learned only by experience.

ANESTHETIST AND OPERATOR IN SAME FIELD

Considering the aims toward the ideal anesthesia which the above facts and opinions suggest, and applying them for operations in and about the mouth or head, we find the following provisions indispensable:

1. After induction of anesthesia the anesthetic must be uninterrupted and capable of administration to any degree the exigencies of the case demand.

2. The operator and administrator must have equal access to the respiratory tract, each without interrupting the other.

3. Sufficient anesthetic must be admitted by either mouth or nostrils alone.

4. The ether vapor must be warmed, and the extraction of heat by the rapid evaporation of ether must be met by the constant supply of an equal number of calories.

5. Finally, the method must be safe, as against the possibility of pumping any liquid to the patient, and simple,[17] so that anyone, qualified for any anesthetizing, may use it, with only the ordinary precautions.

The Junker inhaler for chloroform, which was brought out about 1860, consisted of a small 1-ounce bottle with inlet tube to the bottom for air and outlet tube from the top to the patient. Many deaths resulted from

11. Carrel, quoted by Henderson: Surg., Gynec. and Obst., August, 1911, p. 165.
12. Cunningham: Rectal Anesthesia,, Boston Med. and Surg. Jour., April 20, 1905.
13. Chaput: Spinal Anesthesia, Edinburgh Med. Jour., 1908, xxiii, 243.
14. Allen, Freeman: Spinal Anesthesia, Boston Med. and Surg. Jour., 1910, clxiii, 715.
15. Lee: The Use of Ethyl Chlorid as a General Anesthetic in the Pennsylvania Hospital, Ann. Surg., 1908, xlviii, 641.
16. Crile: Nitrous Oxid Anesthesia, Surg., Gynec. and Obst., August, 1911, p. 170.
17. Bevan: Choice of the Anesthetic, THE JOURNAL A. M. A., Dec. 2, 1911, p. 1821.
18. Herb: Drugging Before Anesthesia, THE JOURNAL A. M. A., May 6, 1911, p. 1315.
19. Henderson: Heart Failure Under Ether, Surg., Gynec. and Obst., August, 1911, p. 162.
20. Crile: "Anoci-Association," THE JOURNAL A. M. A., Dec. 2, 1911, p. 1811.

its use; the files of the *British Medical Journal* contain many compiled reports. Hewitt improved it with a double tube, to obviate the possibility of connections getting reversed and liquid chloroform being pumped to the patient. Kocher in his "Operative Surgery" said, "Rose declares that the introduction of Junker's apparatus is the most important advance that has been made in the matter of anesthetics."

THE PRESENT METHOD OF PHARYNGEAL INSUFFLATION

I have used the method now described in some form for three or four years. It was presented to the New Jersey State Pediatric Society in June, 1911.[21] It is designed for ether, but I could recommend it for chloroform, did I believe in chloroform by insufflation, as I do ardently in ether. The apparatus consists of a double rubber bulb maintaining air under a little pressure, which flows, controlled by a cock, through ether in one bottle, then into a second bottle (empty) and thence by tube to the patient's oropharynx or nasopharynx, as may be chosen. The bottles hang in a water-bath heated by an incandescent lamp beneath. A thermometer is kept in the water. After induction is accomplished, preferably with nitrous oxid, anesthesia is maintained with ether. It accomplishes the following objects: (1) the air-pressure being constant (70 mm. of mercury is the maximum with hand-bulb), the administration is even and (2) its rapidity is controlled by means of the stop-cock; (3) the ether in the first bottle is warmed and the etherized air passing from it is kept warm in the second bottle, which also serves (4) to catch any ether condensed in the tube beyond, besides absolutely preventing any being pumped from the

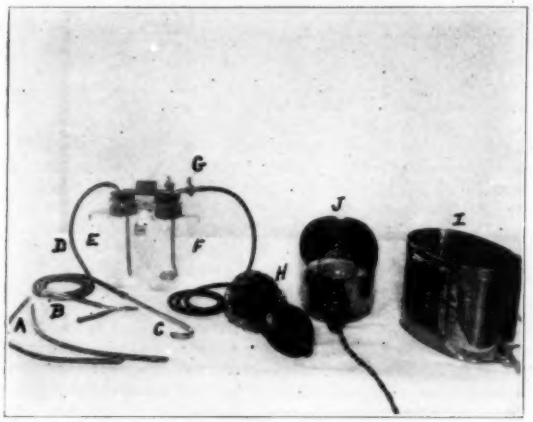

Fig. 2.—Insufflation apparatus for ether anesthesia; (*A*) two nasal catheters (graduated), or (*B*) two nasal glass tubes, or (*C*) a metal tube (shaped for angle of mouth) are attached to (*D*) delivery tube, coming from (*E*) empty bottle connected with (*F*) ether bottle (graduated in grams, also liquid ounces). (*G*) Cock governing the air pumped from (*H*) double bulb. (*I*) Water bath, in which the bottles are suspended. (*J*) Base (containing incandescent lamp), on which the water bath fits; but which, in lack of electricity, may be dispensed with and the cooling water replaced with warm by hand.

first bottle over to the patient; (5) a temperature of 98 F. is maintained in the water by the incandescent lamp, the calculation being that the ordinary and convenient 16-candle-power lamp will in the copper vessel replace the loss from the rapid evaporation of ether (but, without this lamp attachment, simply drawing off some water, by the water-cock, and replacing with warm answers as well); (6) there is flexibility in choice of three methods of delivery to patient, by metal tube in angle of mouth, or pair of Lumbard's glass tubes in nostrils, or pair of rubber catheters, graduated, introduced to level of the soft palate; (7) operator and administrator are mutually independent in the same field; (8) the apparatus is simple, easily kept in perfect order, inexpensive, portable, usable by any anesthetist anywhere.

I emphasize the value of warming the ether, a facility not hitherto appreciated, except by very few writers recently, notably Gwathmey.[22]

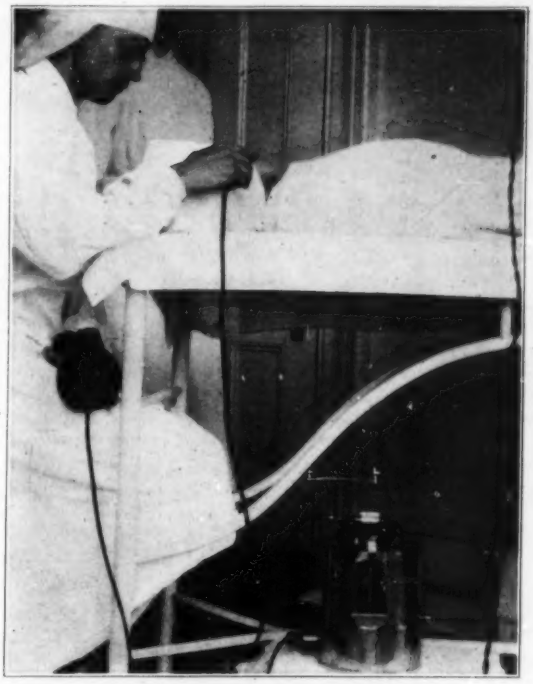

Fig. 3.—Ether anesthesia by pharyngeal insufflation. Ready for operation. The apparatus is entirely out of the way, only a metal tube in mouth of the patient being in the field of operation. The air pressure is steady. Administration is uniform (determined by cock). The ether vapor is warm. No liquid ether can reach the patient.

Cunningham and Anderson[10] state that, with the open method, "experiments have demonstrated that in a room at 80 F. 2.1 per cent. ether vapor reduces the inhalations to 30 F. and 5.4 per cent. ether vapor reduces them to 0 F., thus causing a loss of about 21,000 calories of body heat for every ounce of ether used." Even this does not fully show the conditions in practice, as I have found, by thermometer in the gauze, the temperature to be 0 F. during operation. Contrast that method with insufflation, in which the vapor delivered into the pharynx of the patient is 87 F. and may be maintained at 84 F. under any rate of flow.

INTRATRACHEAL INSUFFLATION

In the discovery of intratracheal insufflation, Dr. Meltzer,[23] with Dr. Auer, has done the world great service. When automatic respiration has ceased, to be

21. Pinnco: Anesthesia in the Surgery of Childhood, Arch. Pediat., January, 1912, p. 18.

22. Gwathmey: Methods of Anesthesia, THE JOURNAL A. M. A., Feb. 17, 1912, p. 467.

23. Meltzer: Intratracheal Insufflation, Med. Record, New York, March 19, 1910.

able to substitute, surely and safely, artificial respiration, or, when operation necessitates opening the thoracic cavity, to be able to give an anesthetic safely and smoothly, in the absence of any automatic breathing, or even excursion of the lung, is a discovery which marks a new era. The courtesy of Drs. Meltzer and Auer in personal demonstrations at the Rockefeller Institute is appreciated and cordially acknowledged. It is thrilling to see an animal with both lungs exposed to atmospheric pressure anesthetized and oxygenated so well that the lungs are pink and full and the skin and mucous membranes looking as in healthy sleep. Especially interesting to our topic is Dr. Meltzer's latest publication,[24] of artificial respiration by pharyngeal insufflation. It could be easily applied with my apparatus, adding a manometer and provision for substituting instantly oxygen or air in place of anesthetic and thus equip the operator with resources for treating respiratory embarrassment from any cause. This is a preliminary note on some suggested experimental study (Fig. 4).

ADVANTAGES

My method, while designed chiefly for throat and head operations, to facilitate surgeon and anesthetist working in the same field, maintains an anesthesia so dry, even and controlled, whether shallow or deep, that I have come to use it for all kinds of operations, including the following: tonsils and adenoids, brain tumors (positions supine and prone), cervical adenitis, cancers of tongue and jaw, lymphangioma of tongue, appendicitis, hernia, meningitis (draining the fourth ventricle), prolonged dental operations, hip dislocations, osteomyelitis, club-feet, knock-knees, mastoiditis, pelvic operations, nephrectomy. The warm, evenly supplied ether vapor seems to find so easy entrance through the pulmonary

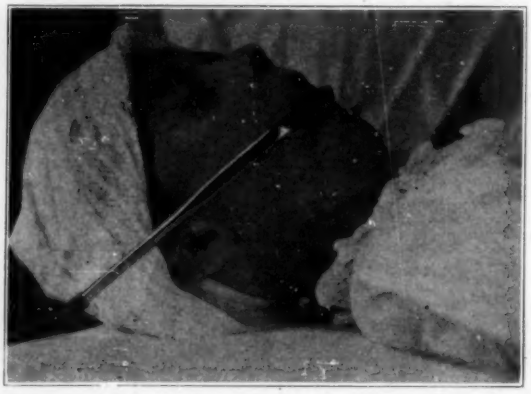

Fig. 4.—The mouth tube in position, delivering a steady, warm, dry ether vapor. Both anesthetist and operator are independent though in the same field.

alveoli that some of the common embarrassments of other methods, such as wet anesthesia when crowding the ether, are entirely absent (and no new ones occur!) (Fig. 5).

A recent discovery was the unexpected ability to anesthetize an alcoholic man, to whom ether was like alcohol; increasing the dose by ordinary mask, therefore, would simply produce a vicious circle of cyanosis and muscular rebellion. He yielded on introduction of the mouth-tube, in one or two minutes, smoothly, with good color and dry throat, and he had had no preliminary hypodermatic of any drug whatever! That the success in such a case may be life-saving against fatal, prolonged period of ether excitement is shown in the case mentioned by Henderson.[19]

24. Meltzer, S. J.: Pharyngeal Insufflation, A Simple Method of Artificial Respiration, THE JOURNAL A. M. A., May 11, 1912, p. 1413.

FOUR ESSENTIAL ELEMENTS

In conclusion, recognition is urged that the following factors are all of them essential in this method of anesthesia by pharyngeal insufflation: (1) steady air-pressure (whether by hand-bulb or foot-bellows); (2) a cock, fixing, at the anesthetist's discretion, the delivery of vapor to the patient, and maintaining it evenly; (3) a catch-bottle interposed between the ether-container and

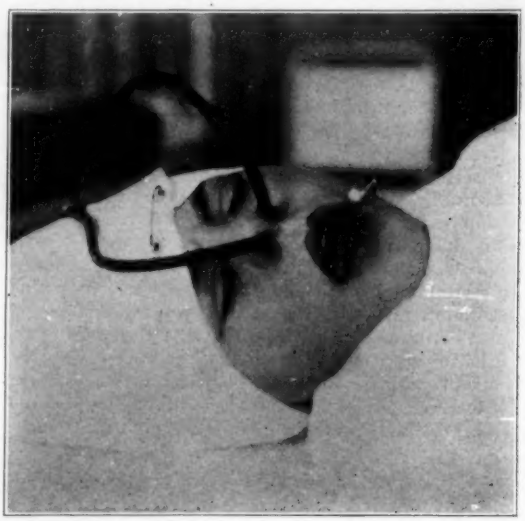

Fig. 5.—The nasal catheters in use. The mouth tube is also shown, though usually unnecessary in addition.

the delivery tube; (4) a heating system which will maintain evenness of temperature.

Without all of these the method would be fundamentally lacking; with them, even in different form, it would have the essential elements.

199 Garside Street.

ABSTRACT OF DISCUSSION

DR. JAMES T. GWATHMEY, New York: It has been stated that it is impossible to heat ether vapor. I have made a number of elaborate experiments to prove not only that vapor can be heated but also that it can be kept at a uniform temperature as long as required (*New York Med. Jour.*, June 1, 1912). There is nothing in the world that cannot be heated. To say that one cannot heat ether vapor is to violate every law of physics as we know them to-day. Especially is heat desirable in the administration of anesthetics to children, because loss of heat is one reason for shock. You all know how rapidly a child parts with heat under an anesthetic. Every precaution should be taken to avoid this.

Sequence in anesthetization has come to stay. Dr. Woolsey has proved that by having the child inhale the essence of orange by the closed method and following with ether the cyanosis that sometimes accompanies the administration of the "gas-ether" sequence is not produced. With little children especially I do not believe in the use of chloroform, except in an exceedingly hot climate; even then I do not want to take the responsibility of saying that we should use chloroform throughout with the clinical results of the effects of chloroform before us. Nevertheless, I think that is one of the best methods of introducing the anesthetic to the child. The chloroform-

ether sequence is, I think, better than the orange-ether sequence, but the essence of orange-chloroform-ether sequence is the best. The child is frightened quite frequently by the placing of the mask with bag over its face, and the results of recent experiments show that the psychic element must be considered. It is much better to get the child to sleep in a natural way. It is wise to give the essence of orange on an open mask. Place one or two drops of essence of orange (25 per cent. U. S. P.) on the mask, and then follow with ether. As respirations become automatic, change to ether. The good results of the ether are obtained without frightening the child with nitrous oxid. I feel that it is better to do away with the orange if possible and to take the child in a normal sleep. Select an hour before the child naturally awakes. Place one or two drops of chloroform on a gauze sponge held by an artery forceps and approach the child gently before it awakes; change to ether at the onset of surgical anesthesia.

DR. W. C. WOOLSEY, Brooklyn: The anesthetization of children is of prime importance because of their extreme susceptibility to all toxins, be they chemical or otherwise. As surgery in children advances, the question of anesthesia becomes important. The administration of any anesthetic to a child by the ordinary open-drop method has disadvantages familiar to all. The particular point to which I would like to call attention is that failure to anesthetize children successfully is usually due to the fact that the irritating ether vapor as the child inhales it, dropped on the ordinary open or closed cone, produces a collection of mucus in the pharynx, contraction of the pharyngeal muscles and paralysis of the muscles of the glottis. This in turn produces respiratory obstruction, which occurs early in the anesthesia of children and prevents them from getting the proper amount of anesthetic. Anyone who has given an anesthetic for the removal of tonsils and adenoids knows the difficulty of getting the child thoroughly anesthetized. It is not because one does not use enough anesthetic, but because there is respiratory obstruction and the child cannot get the anesthetic.

With the introduction of either nasal tubes or catheters into the pharynx, past the point of obstruction, all the disadvantages of respiratory obstruction are eliminated, and the minimum amount of ether may be introduced with the maximum result.

DR. F. W. PINNEO, Newark, N. J.: The advantage of the essence of orange is that it is so pungent and pleasant, especially for children, that it overcomes the undesirable element, terror, and induces them to take the ether vapor easily, which, without its aid, would be less acceptable. I think it answers an admirable purpose. I do not advocate nitrous oxid for very little children. Their air space is too small. Chloroform in sequence would not have its deleterious effect provided one remembers two things: the error of irregular and inconstant administration and that holding of the breath followed by a gasping inhalation which will flood the lungs with concentrated chloroform, and possibly induce death. The admirable report of the American Medical Association Anesthesia Commission, just published in our Delegates' Handbook, even after condemning chloroform makes a place for it for induction, if it be given early (not after a prolonged ether excitement) and administered perfectly evenly. I prefer nitrous oxid to ether. If the child is too young for nitrous oxid, essence of orange with straight ether is to be commended.

Combustion of Sugar in Diabetes.—An active person in perfect health can burn as much as a kilogram of glucose during the day. In some mild cases of diabetes the patient can burn from 100 to 150 gm. of glucose derived from ingested carbohydrate, plus the sugar formed from the protein of the diet (about 50 gm.) It may be pointed out that certain varieties of starch are more thoroughly utilized than others. Thus the diabetic tolerates oatmeal starch much more readily than any other kind. As the case becomes more severe, ingested sugar cannot be burned and is entirely eliminated, but the sugar of protein origin is still available for combustion. In a later stage even the sugar from this source cannot be burned.—V. C. Myers and M. S. Fine in *Post-Graduate.*

SOME REASONS FOR SURGICAL FAILURES IN CHILDREN *

LEGRAND KERR, M.D.
BROOKLYN

Irrespective of the justice of the conclusion, the fact remains that surgical procedures in general which affect children are not held in due regard by a large proportion of the general public and are not always regarded with favor by the profession.

Undoubtedly this present attitude has been fostered by the inadequacies of which I shall presently speak and while they remain the chief, yet they are not the only factors. I shall eliminate from this consideration all emergency cases, because these are often undertaken under the most unfavorable circumstances and the suddenness of the event leaves the parents unprepared for the exercise of clear judgment. But we must also recognize the fact that elective surgery among children comes in for a large share of public disapproval.

One of the difficulties of the situation is that we are unable to define surgical success satisfactorily. To the surgeon it means something entirely different from what it means to the public and the opinions remain so widely divergent that it often requires the personality of one with a mutual interest to adjust them.

Here, then, is the opportunity for the family physician; the one who is so close to the confidence of the parents and yet who fully understands the possibilities and limitations of surgical intervention. A neutral or politic attitude for him is in no manner constructive of the best interests of the child, the parents, the surgeon or himself, but is destructive to the public confidence in a profession of which he is an important member.

More can be done by the family physician to restore public confidence and a sane attitude toward surgical procedure than through any other channel.

The proper and efficient surgical examination of a child requires a previous intimate knowledge with the normal child at the various periods of its development. Without a knowledge of the morbid tendencies which are peculiar to each period, the unstable equilibrium, the varied and irregular disturbances and the peculiar reactions to either injury or disease will lead the examiner astray. To some extent this knowledge may be obtained from books, but in the main it is acquired just as the surgeon's operative skill is required, by years of experience and observation. It is not sufficient in every case to limit the examination to the surgical condition present, although this is commonly done.

An adequate examination requires that all possible information be obtained of the child's organism as a whole, for this broader view will aid in the discovery of underlying conditions which, when relieved, will lessen the probability of unpleasant and sometimes fatal complications during either the surgical procedure or convalescence. Such an examination, while taking cognizance of every detail of the child's physical condition, should also be supplemented by a detailed history of previous conditions. It is not a common practice among surgeons to obtain a definite history of the possible exposure of the child to infectious or contagious disease and yet we have seen several instances of nearly fatal results (and a few fatal ones) which were due to a disregard for this feature of the examination.

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* Read in the Section on Diseases of Children of the American Medical Association, at the Sixty-Third Annual Session, held at Atlantic City, June, 1912.

While I would not be misunderstood as claiming that every "surgical child" should be examined by a pediatrist, yet it remains a fact that the proposition is often a twofold one and the attempt of the surgeon to cope with a surgical procedure with which he is entirely familiar in a being with whom he is unfamiliar is often as disastrous as would be the attempt of the pediatrist to undertake a surgical procedure with which he is unfamiliar in a being with whom he is entirely familiar.

There are so many modifications of the purely surgical consideration that are offered by the changing response of children at different periods and particularly modifications which have their genesis in underlying nutritional states, which few but the trained pediatrist can understand and cope with, that it is unfortunate that the operative skill and courage of the surgeon is not more often coupled with the judgment and experience of the pediatrist. Such counsel would give the child and the surgeon their best chances.

A thorough examination is in practically every instance necessary to establish an accurate diagnosis. For the reason that the examination of young children is commonly incomplete, the diagnosis is often inaccurate and not complete enough to insure a full measure of success. This diagnostic inaccuracy is fostered many times by a knowledge that has been acquired through unreliable sources. In a few instances the accurate knowledge is so consciously insufficient that psychologic factors are allowed to enter. Take, as a common example, the subject of acute appendicitis in children; its importance is so emphasized and it is so constantly the topic of discussion, that it is immediately thought of when abdominal pain occurs in children. And yet abdominal pain is commonly a minor feature of acute appendicitis. Or again, take meningitis; if varied nervous phenomena are present, which are not readily understood, meningitis is often diagnosed when it does not exist. My consulting records show that it is rare to find a diagnosis of acute appendicitis or meningitis overlooked in childhood, but on the other hand, it is common to find them assigned as the cause of symptoms when they do not actually exist.

Generally stated; an accurate and a complete diagnosis is essential to the institution of adequate treatment, but this is not invariably so. For example, I have observed several instances in which, when viewed from the purely surgical point of view, an accurate diagnosis was practically impossible without exploratory incision or other surgical procedure. And yet there were other factors present which would markedly influence the end-results.

If such factors are ignored or reduced to a minor consideration there is immediately introduced into the problem an uncertainty which does not conserve the morbidity or mortality of postoperative convalescence. To appreciate what the end-results will be in any given case requires very often a close consideration of facts that at first seem to have little or no bearing on the disease or injury, but which will force themselves into the problem just as soon as the depressing effects of any surgical procedure are brought into play.

Not infrequently we are asked: "Can the child stand the operation?" Too often it is dismissed thoughtlessly and the child suffers a serious injustice because a surgical procedure that promises a result in the first instance is delayed until in a later stage it is accompanied by added difficulties and does not restore the child's full efficiency. Such a question should be answered by another: "Can we in this particular case adjust our surgical technic to meet all of the conditions presented by this particular child?" The claim is constantly made that there is a too ready recourse to surgery in childhood and to some extent this may be true, but it is my opinion, based on several years of observation, that operative timidity and procrastination are often the cause of operative insufficiency, and that our greatest danger in childhood is in good surgery wrongly applied.

The final results of a skilfully executed surgical procedure have not infrequently been compromised or jeopardized by overinterested, underinterested or inadequately warned assistants.

It is assumed that their selection as assistants is proof of their ability, but irrespective of this, all three classes influence the final outcome of a surgical procedure in childhood in exactly the same way, but from different motives. The overinterested assistant is more alive to the technic of the operator than he is to the best interests of the child; the underinterested assistant looks on the procedure as just so much necessary work to be done and is not in full harmony with the operator's scientific interest; the inadequately warned but trained assistant simply does not know. Each in his own way influences the end-result, contributing not so much to the mortality as to the morbidity, because each contributes more or less to the production of shock.

Now what factors in the production of shock does the assistant have more or less under his control?

They are mainly two: hemorrhage and injury. It must be recognized that whether the blood-pressure is directly reduced or not, the mere loss of blood is sufficient in itself to cause shock in children and the degree is influenced by the rapidity of that loss. It is not sufficient therefore simply to prevent the loss of blood, but the assistant must be zealous in immediate attention to all bleeding surfaces and whenever practical, a vessel should be secured before its division.

Injury that conduces to shock in childhood is not only that made necessary by the operation, but, in many instances, is the result of pulling or dragging on the tissues and particularly on those tissues which are directly connected with some organ. It is as commonly the unnecessary injury done by the assistant as the necessary injury by the operator that adds to the degree of shock in young children.

In far too many instances it has been the policy to designate the least experienced intern as the anesthetist and, without going into a discussion of the matter, it is sufficient to state that such a procedure is unwise and in no way conserves the best interests of the patient or the operator and is a most certain way of adding to postoperative morbidity and mortality and of prolonging convalescence.

Too often the rôle of the anesthetist has been assumed as being necessary but unimportant. And the anesthetist himself has largely contributed to this general opinion by assuming the position of a necessary adjunct to a surgical procedure rather than realizing and making others realize that he is actually and largely a direct contributor to the success or failure of the procedure. Too often he asks, "What anesthetic shall we use?" Too often he, without protest, obeys the command to "push the anesthetic." Too often he accepts the relationship of an inferior when he should be an equal. Who is better able to decide what anesthetic to use and when to push it or withhold it, the trained anesthetist or the surgeon? Surgeons should be more acute generally in realizing that the anesthetist is either a constant danger

during a surgical procedure, a necessary adjunct who requires constant watching and suggestion, or is a most valued co-worker according to the thoroughness of his training and experience. And, if in the latter class, it is the operator's duty outwardly to recognize within and without the operating-room the true value of his service and surround his position with the dignity and esteem which it rightly deserves. The danger of an anesthetic in young children is not so much from the asphyxial element as from the toxic, and therefore the preservation of normal functioning should be left to the anesthetist rather than to the operator.

In the postoperative care of children it must be remembered that manifestations of discomfort are not so insistent as in adults, and that children do not often complain, so that in such matters as the detection of post[illegible]e hemorrhages, thirst and pain, there is a necessity for more skilled and careful watching than is essential in adult life. Irrespective of the kind of anesthetic or the length of its administration, thirst becomes a prominent factor and definite instructions should be left for its relief. The same is true of pain; there are many instances in which its occurrence can be predicted with certainty and it then becomes a duty to anticipate it by the use of some means to minimize its intensity.

But most often the efficient management of postoperative convalescence begins before the operation. There are three large classes of children that come to the surgeon for elective surgery: first, those with a surgical condition which interferes with the general health; second, those with a surgical condition which has little or no effect on the constitutional condition, who might be considered normal if it was not for the surgical condition, and lastly, those who, irrespective of their surgical condition or its influence on their general health, exhibit unmistakable evidences of nutritional faults which, while possibly not much exaggerated by their disease or injury, will become important factors when surgical intervention is contemplated.

In the first class, the relief of the disease or injury is all that is required because the surgical procedure is not interwoven with any problems dealing with constitutional depression independent of it. The restoration of the patients to normal efficiency is a question of surgical relief plus ordinary hygienic care and diet.

There is a similar proposition in regard to the second class also, because the surgical condition is largely or wholly responsible for any constitutional symptoms. We ought not to be satisfied, however, with the mere restoration of a balance which follows the elimination of the surgical cause, but should go beyond this and restore normal rather than relative efficiency.

The third class needs more attention before and after than during the operation. Here, then, is the opportunity for the most skilled assistance and counsel obtainable, so that the mortality may be reduced, the morbidity lessened and postoperative convalescence shortened and made more certain and comfortable.

While the general attitude of the public toward surgical procedures in children is not what it should be, there are several definite factors which have led to its unconscious formation. Inaccurate diagnoses are more common in children than in adults and incomplete diagnosis is the rule rather than the exception, both being brought about largely by the lack of intimate knowledge of children in general and the manner in which they react to injury or disease.

An inaccurate or incomplete diagnosis often, although not invariably, leads to inadequate treatment and, as a consequence, the child suffers either from too much or from too little surgery. Inadequate preparation of the particular patient and his surroundings is commonly evidenced by the inefficient examination and observation which precedes the operation; there is often inadequate operative care because no special attention is paid to planning for rapid work, a brief and skilfully administered anesthetic, the most efficient assistants and the maintenance of body heat. And it is a far too common fact that an unpleasant postoperative convalescence is commonly the end of an otherwise perfect procedure because the child has not been understood and safeguarded at every point. Postoperative complications are not always directly due to the surgical procedure; a prolonged postoperative convalescence is rarely a surgical proposition and the surgeon is not always capable of handling the whole proposition because at one period there existed a definite surgical problem.

If there is to be a restoration of public confidence which will give the surgeon his due, it must come through a correction of the inattention to those things which surround and bear on the operation itself and a closer relationship between the surgeon, the family practitioner and the pediatrist. Operative procedure is not sufficient; the little one must be returned to its parents not alone surgically relieved but equipped for efficient childhood.

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ABSTRACT OF DISCUSSION

DR. FRANK C NEFF, Kansas City, Mo.: Sometimes it is the custom for a nose-and-throat surgeon to operate on a child without the immediate knowledge of the physician who has often observed that child. I have had two instances in which such work was responsible for a grave condition which might have been prevented had the surgeon first obtained an accurate history of the child's previous condition. The first child had been a victim of periodic vomiting, and if I had known the child was to be operated on I think certain suggestions regarding the anesthetic and subsequent care of the patient with regard to washing out the stomach, etc., would have been of some value. It seems that in this case the child vomited for three days following the administration of the anesthetic, which was administered by a capable man.

In the second case, the child had been to some extent a bleeder, and had quite a profuse hemorrhage after the removal of the tonsils. It is not probable that the previous history of hemorrhage would have been disregarded had the child's regular physician been consulted.

DR. FRANK W. PINNEO, Newark, N. J.: Children are the most helpless patients, and although we have learned to view their feeding and medication from a pediatric standpoint, their surgery has not yet reached this state. Chloroform is so dangerous, because it is given to a small child in an indeterminate dose for an indefinite period, that surgeons are giving up its use. Does the anesthetist think, for instance, of the result of the excitement produced by the anesthetic on the child as one of the causes of sudden death? Does he know that death may follow after a considerable number of minutes and yet be the result of the anesthetic? Does he realize, also, that the renewal of an anesthetic after a few hours is fraught with danger of sudden death, especially in children? How often do we hear it said, by excellent and responsible men who work with children, "This is but a slight operation; we will just give him a whiff of ether!" A child is more subject to shock and narcotics than an adult. Because a child is easily anesthetized, should we "smother" him with an anesthetic that he will remember all his life with terror of surgery and surgeons? In this era there are so many conditions that a child may have which can be relieved by surgery that he should never be given this terror of anesthesia. Better to postpone operation than to induce anesthesia with

terror. Long operations are very bad. So also is rough handling of tissues, necessary through haste. Standing between the two we may have to choose. Bloodgood emphasizes the importance of short anesthesia, but he also recognizes the shock of rough surgery and says that he would rather prolong the anesthetic and handle the tissues carefully and gently, especially in children.

Dr. Kerr suggests a number of excellent diagnostic points on appendicitis and meningitis. Osler says that there is "no symptom of meningitis present in a child which may not be present when there is no inflammation of the meninges at all." Lumbar puncture, therefore, is indicated, if not needed, for diagnosis. And how important, and sometimes difficult, is the differential diagnosis of appendicitis and functional intestinal toxemias?

DR. H. J. GRAMLING, Milwaukee, Wis.: A number of cases have been reported in which death was probably not due to the anesthetic but to the persistence of the thymus gland.

MODIFICATION OF THE FERGUSON OPEN-DROP METHOD ETHER-INHALER, AND MODE OF ETHERIZATION

C. E. PRUDDEN, M.D.
DULUTH, MINN.

After extended hospital use of the ether-inhaler devised by Robert H. Ferguson, M.D., of East Orange, N. J., for the maintaining of surgical anesthesia by the open-drop method, and having become thoroughly impressed with the advantages of its use, I employed the principle of construction in a modification which I believe has several advantages over the original.

Using the principle of the Ferguson inhaler as a working base, I have added to it the simple and well-known celluloid gas chamber and rubber mouthpiece of the ordinary nitrous oxid gas-inhaler.

The apparatus is not so complicated as one would suppose on first inspection. It consists of a double copper-wire frame. The inner frame (*A*, Fig. 1) is a convex frame of four wires fastened to the base wire; the outer frame (*B*, Fig. 1) is of a heavy wire ring supported by four wire legs. This is attached to the celluloid face piece (*C*, Fig. 1). Over the inner frame (*A*, Fig. 1) are stretched several thicknesses of surgical gauze, which is held in place by a wire loop (*D*, Fig. 1) that slips tightly over the gauze.

The wire frame with the gauze is then covered with a hood of oiled silk having a draw string at top and bottom. The bottom string when drawn tight and tied around the base wire will keep out all air from below; the top string is drawn up until only an opening of about an inch in diameter remains. Through this opening the ether is dropped (*not poured*) on the inner gauze hood, which is made of eight or ten layers of gauze.

The rubber mouthpiece (*F*, Fig. 2) is then slipped over the celluloid frame and inflated by blowing into the valve and then tightening the valve to hold the air which acts as a seal and face-cushion (Fig. 3).

Should it be desired to have the patient in the lateral position instead of the supine, a hood with an opening in the side instead of at the top may be used.

When assembled for use the inhaler consists of two chambers (*A* and *B*, Fig. 2), and when ether is dropped through *C* in the hood *D* it falls on the gauze *E*, supported by the wire frame, and volatilizes, thereby saturating the air in the chamber *A*.

This air saturated with ether is of a higher specific gravity than pure air and is drawn and falls through the gauze into chamber *B*, where it is inhaled as a vapor by the patient.

The rubber mouthpiece fits tightly over the mouth and nose and conforms to the contour of the face and allows no air to enter from below into chamber *B*. This advantage of fitting tightly to the face does away with the greatest disadvantage from the use of the Ferguson inhaler, namely, the use of towels, either wet or dry, which are commonly used around the base of the Ferguson inhaler to exclude the air from below. It will also be found unnecessary to place a towel or covering over the patient's eyes to guard against any ether which might run into them.

The placing of a covering over the patient's eyes will often at the onset of anesthesia produce a sense of fear in patients by excluding their vision, for they feel that something is about to be done which they should not see, something mysterious, and they at once lose confidence in the anesthetist, which above all should be guarded against, especially in children and hysterical women. Omission to cover the patient's eyes also has the advantage of not obstructing the movements of the

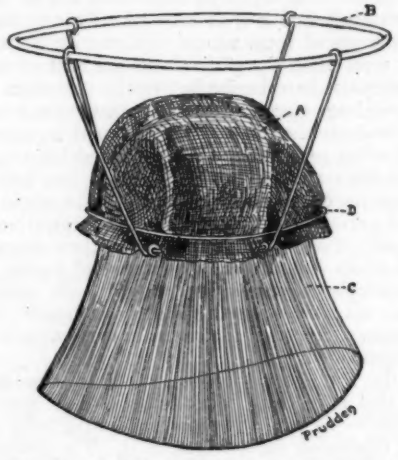

Fig. 1.—Frame of inhaler showing wire construction and gauze pad in place.

anesthetist, by relieving him of the necessity of having continually to remove a towel to expose the eyes in watching the pupils for contraction and expansion.

MODE OF ETHERIZATION

The inhaler is held in place over the face by the left hand, the third and fourth fingers holding up the jaw; the right hand is free to drop the ether at the rate of three or four drops a second. Through the transparent celluloid frame of the lower chamber (*B*, Fig. 2) can be noted the condition of the mouth; the color of the lips can be watched and the presence of saliva and mucus can be observed quickly and the inhaler hastily removed to clear the mouth and nose of foreign matter.

The patient is first shown the inhaler and is told that placing it on the face will in no way interfere with his respiration; he is also told that the first few inhalations will be unpleasant and that at one stage of the anesthesia there will be a slight choking sensation which will pass away with a few deep inspirations; he is told to breathe naturally and not to resist the anesthetist, but to allow himself to be overcome by the ether.

The anesthetist then has the patient's confidence, which is so much desired for a successful anesthesia; the

patient understands that the responsibility of getting rid speedily of any unpleasantness rests with him and he will cooperate by breathing deeply, which will in great part do away with the initial persistent fixation of the chest so annoying to the anesthetist.

The inhaler is then gently placed over the mouth and nose; a few inhalations are allowed to demonstrate that breathing will in no way be interfered with and then the ether is slowly dropped on the gauze through the opening, gradually at first so as not to frighten the patient, and also to produce an analgesic effect on the mucous membrane of the posterior nares, pharynx and larynx, so that it becomes tolerant to the ether vapor. The ether is then increased in rapidity of drops to the second; surgical anesthesia will be produced in from four to nine minutes, generally without any manifestations of the so-called second stage or stage of excitement. Should the chest become rigid and the breathing cease for a short period the anesthetist should not be alarmed and remove the inhaler, as this stage will soon pass if the lower jaw is forced forward of the upper and the ether is increased. The anesthetist may maintain

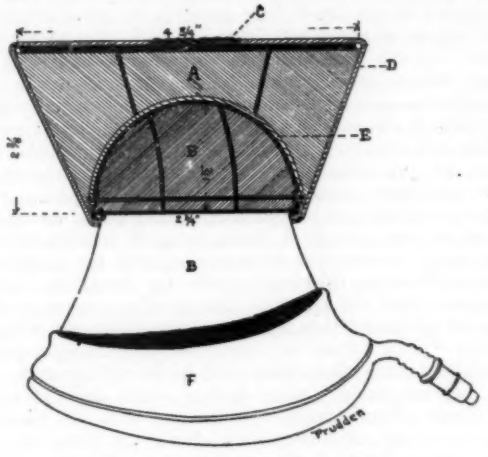

Fig. 2.—Sectional view of inhaler.

surgical anesthesia for hours by controlling the number of drops of ether and watching the general condition of the patient, the lips, pupils and pulse, the latter by means of the little finger of the left hand placed on the facial artery where it crosses the inferior maxilla, this being done while holding the jaw; or by discontinuing the anesthetic a few seconds and taking the pulse by the index-finger of the right hand on the temporal artery just anterior to the ear.

Better results will be produced by continually dropping the ether and gauging the amount than by rapidly dropping the ether from time to time with long intermissions.

Rarely, if ever, will nausea and vomiting follow the use of this inhaler with the anesthetic given as directed, and the recovery is speedy.

After the anesthetic the oiled silk hood and gauze pad are removed and the whole frame dipped into some antiseptic solution, dried and a new gauze pad and hood added, when the inhaler is ready for another anesthetic.

Whether or not the much-disputed statement is true that ether vapor given by the open-drop method chills the patient's lungs, I have yet to see a case of postoperative pneumonia or bronchitis follow as the direct result of the anesthetic given by this method and with this inhaler.

ADVANTAGES FROM USE OF THE INHALER

I have kept a thorough record of 300 anesthesias, consisting of the general run of hospital patients, those prepared for operation and emergency accident cases, both sexes and all ages, mostly adults, and including neurasthenics, alcoholics and cases of bronchitis. In speaking of prepared patients I refer to those who had had a clearing of the bowel, no food before anesthesia and were given 1/150 grain atropin and one-fourth grain morphin (dosage subject to discretion) hypodermically half an hour preceding the anesthetic. The latter procedure tends to produce a quieting effect on the sensorium, reduces pharyngeal secretions, accentuates respiration and tends to facilitate the giving of ether in the first stage of anesthesia.

I have not had the most remarkable results obtained and reported by some clinicians, but the following statistics are conservative and based on actual experience in the surgical clinics and have been very gratifying to me:

Fig. 3.—Ether inhaler complete.

1. The average time consumed from the time that the anesthetic is begun to the stage of complete surgical anesthesia is six and one-third minutes.

2. The average amount of ether required to induce surgical anesthesia is 2 ounces.

3. The average amount of ether required to keep the patient in surgical anesthesia is 6 4/5 ounces.

These figures vary greatly according to the patient; it takes from four and one-half to nine minutes, and from one-half to 2½ ounces of ether to induce surgical anesthesia. It will be found that as the length of time of the anesthesia increases, the amount of ether used will decrease and so a short anesthesia of a few minutes may require more ether than the whole second hour of a continued and long anesthesia.

The air cells of the lungs become so saturated with the ether vapor during a lengthy anesthesia that it will require very little to maintain an even stage of relaxation and not a too profound narcosis. I have repeatedly observed anesthesias with the use of other inhalers in which it required from twenty to thirty minutes to secure sufficient relaxation in the patient to allow the surgeon to proceed; the patient would become cyanotic, breathing would cease, the anesthetic would

have to be discontinued until the prolapsed tongue was brought out of the throat, and artificial respiration would be resorted to and recourse made to the too convenient hypodermic. Generally in these cases the anesthetist has flooded the inhaler with ether and used from 12 to 18 ounces of ether an hour. Of course these cases are rare now, owing to the more intelligent training of anesthetists and to the employment of the open-drop method inhaler.

This inhaler can be made easily with the aid of a pair of pliers and some copper wire and by following the accompanying illustrations. The celluloid lower chamber (*C*, Fig. 1) and the rubber mouthpiece (*F*, Fig. 2) can be procured from any surgical supply house and the oiled silk hoods can be quickly sewed together on a machine.

A summary of its advantages follows:

1. There is absolute freedom from any face covering except the rubber mouthpiece, affording the anesthetist a constant and unobstructed view of the patient's face and condition of the pupils, and relieving the patient of fright which would follow the use of a face covering of towels, excluding his vision.
2. The inhaler fits snugly to the contour of the face, thus eliminating all air from around mouthpiece.
3. Through the transparent celluloid face-piece, saliva, mucus and the color of the lips can be noticed.
4. Absolute safety is secured, owing to the reduced amount of ether required.
5. The administration of ether is simple.
6. The stage of excitement is reduced to a minimum.
7. Surgical anesthesia is produced rapidly.
8. Postoperative vomiting and nausea are infrequent as a direct result of the ether.
9. The same inhaler fits both children and adults, and is adapted to both the dorsal and the lateral positions.
10. Ether may be administered with this inhaler in cases such as alcoholism and bronchitis, in which ether is contra-indicated when given otherwise than by the open drop method.

NITROUS OXID-OXYGEN ANESTHESIA WITH REPORT OF A FATAL CASE

MOSES SALZER, M.D.
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CINCINNATI

So much has been written of late concerning the safety of nitrous oxid-oxygen anesthesia that it seems to me a note of warning ought to be sounded as to the dangers and difficulties of administration, so that an anesthetic agent as valuable as nitrous oxid should not fall into disrepute. Despite the assertions of the nitrous oxid manufacturers and the exploiters of the machines, nitrous oxid-oxygen is not the safest anesthetic in the generally accepted sense of the word. Outside of dental work or momentary anesthesias it is not nearly so safe in the hands of the inexperienced as is ether. The margin of safety between surgical anesthesia and death is much larger in an ether than in a gas-oxygen anesthesia, and I therefore believe that if nitrous oxid were used as extensively by the inexperienced as is ether, the immediate operative mortality would be higher.

I wish to add here to the reported cases another death due to nitrous oxid. The anesthetic was being administered during my absence from the city by my intern, who had given possibly seventy-five or eighty ether anesthesias, and had had little or no experience with nitrous oxid.

The patient was a woman aged 40 who had had repeated attacks of gall-stone colic associated with jaundice. At the time of the operation, apart from a slight icterus, she was apparently in excellent health. Examination of the chest and urine showed nothing abnormal. Morphin, one-quarter grain, and atropine, 1/100 grain, had been given hypodermatically one hour before the beginning of the operation. The operation itself was a very simple one and had proceeded to the stage of sewing the opened gall-bladder to the peritoneum, the stones having been removed. At this time, which was between twenty and twenty-five minutes after the anesthetic had been started, death came suddenly with an intense cyanosis. There had been some cyanosis during the operation. The respirations and pulse stopped almost immediately and there was absolutely no return of either, despite the fact that massage of the heart through the diaphragm and artificial respiration were kept up for several hours. Cyanosis either continuous or intermittent is always a sign of danger and how much, if any, cyanosis can be permitted in any given case can be determined only by the experienced anesthetist.

A perusal of the literature will show that most of the reported deaths due to this anesthetic occurred either in the hands of the wholly inexperienced or of those just learning the administration of nitrous oxid. I do not wish to go on record as being opposed to the use of nitrous oxid-oxygen anesthesia, as I personally give it the preference in all my anesthetic work, and believe that it ought to be used whenever possible, but not by the occasional anesthetizer. The number of factors which come into play in the administration of this anesthetic are greater than in any other anesthetic, and as the margin between surgical anesthesia and asphyxia is so narrow as compared with the margin of safety in ether, this is essentially the anesthetic for the expert. But the fact that the anesthetic requires skill in its administration is no more excuse for not using it than that a life-saving operation should be refused a patient because it requires skill in its performance.

Let us consider those factors which make for the difficult administration of this anesthetic. In the first place nitrous oxid-oxygen anesthesia is a mixed one, as the vast majority of cases require a preliminary injection of morphin in order that a smooth anesthesia with muscular relaxation may be obtained. When morphin is not given and in a certain percentage of cases when it is administered, ether is necessary for muscular relaxation and still further complicates the anesthesia. Morphin outside of its narcotic effect, which is of value, exerts an even more important influence on the respiratory center in that it increases the tolerance to carbon dioxid and thus allows of the administration of a mixture richer in gas than would otherwise be the case. A slight increase in the arterial carbon dioxid content is a much more potent cause of hyperpnea and a resulting overanesthetization than is a comparatively large diminution of oxygen. Haldane and Priestly[1] have shown that an increase of 0.2 per cent. of carbon dioxid will double the respiratory rate. When nitrous oxid-oxygen is administered without the preliminary morphin injection, the hyperpnea is of serious import and prevents a smooth anesthesia. Nitrous oxid itself is also a respiratory depressant, and this added to the morphin action makes the danger of asphyxiation always a real one. On the other hand, without the use of morphin, the respiratory rate is increased, more nitrous oxid is inhaled and absorbed, and there is again the danger of

1. Haldane and Priestly: Jour. Physiol., 1892, xiii, 419.

asphyxiation, plus an irregular anesthesia to contend with. In either event, the nicest judgment and skill are necessary to conduct a safe and satisfactory anesthesia. Nitrous oxid cannot be administered by any automatic machine; neither can any other anesthetic, as neither patient nor operators are automatic.

Nitrous oxid-oxygen given with ether again complicates the physiologic workings of the anesthetic. Nitrous oxid with "just a little ether," or with more than "just a little" given continuously throughout an operation should not be considered as a nitrous oxid anesthesia at all, but as an ether anesthesia modified by nitrous oxid.

Nitrous oxid-oxygen-ether anesthesia does not present nearly the difficulties in administration as does nitrous oxid-oxygen without the ether. Ether is a respiratory stimulant and counteracts the depressing action of both nitrous oxid and morphin. It is much more powerful as an anesthetic agent, volume for volume, than is nitrous oxid. Therefore those who give "just a little ether," say 1 or 2 per cent., throughout an entire operation (which in some cases may mean 2 or 3 ounces), are able to use possibly 5 or 10 per cent. less gas, for which oxygen can be substituted, which is from five to ten times the leeway allowable when ether is not used, and when a difference of 1 per cent. in the gas or oxygen spells success or failure.

I maintain that when ether in any amount is given continuously during an operation the anesthesia is essentially an ether anesthesia and the patient is subjected to the dangers and disagreeable after-effects of ether. Judging from the amount of ether some administer with the gas-oxygen, these gases simply serve to vaporize the ether, an expensive and unnecessary procedure, as the skilful anesthetist can conduct an ether anesthesia even for prolonged operations with from 2 to 4 ounces of ether without the gas. When the ether is given only for a few minutes early in the anesthesia this is also essentially an ether anesthesia until all ether effects have been eliminated.

I do not wish to appear as condemning this combination, as there are cases in which anesthetization is unsatisfactory or impossible without ether, and if anesthesia by the use of an ounce of ether plus the gas and oxygen is satisfactorily maintained, I believe that the patient is better off than if he has taken 3 or 4 ounces of ether without the gas and oxygen; but these should not be called nitrous oxid anesthesias. To summarize:

1. Nitrous oxid-oxygen is not the safest anesthetic for the occasional anesthetist, and should be administered only by the expert.
2. The number of physiologic factors involved are greater than with any other anesthetic.
3. A preliminary injection of morphin should always be given.
4. Ether modifies the anesthetic and makes it easier to administer, but subjects the patient to the dangers and disagreeable after-effects of ether.

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Recent Work in Anesthetics.—Although the foundation of most of our knowledge of the action of anesthetics has been laid bare through experiments with chloroform, clinically and in the laboratory, it now appears that both physiologists and anesthetists are beginning to regard this drug as having yielded to us all it can, and are turning their attention elsewhere. In America, as we have seen, ether holds the field to a very large extent, although at the moment that field is being encroached on by administration of nitrous oxid and oxygen.—J. Blumfeld in *Practitioner*, London.

RESUSCITATION FROM DROWNING

CONTINUED PERSISTENCE OF HEART-BEAT; DEATH FROM NON-RESUSCITATION OF THE RESPIRATORY CENTERS

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The frequent occurrence of drowning-accidents during the summer serves to emphasize the need of a thorough understanding of the principles underlying resuscitation, and particularly the fact that success ultimately depends on preventing permanent injury from anemia of the brain. There is need of extensive series of figures based on accurate observation of similar accidents which will show the important part the time element bears in such cases. In the following case, while resuscitation was not accomplished, the facts seem to be worth recording because the heart continued to beat for so long a time while artificial respiration was being given:

The patient was a strong, well-developed man, aged 28, who had apparently been seized with cramps while swimming in about 7 feet of water. When attempts were made to get him out of the water he struggled so hard that he not only prolonged the efforts but also nearly drowned two of his rescuers. In all probability he was submerged between four and five minutes. After he was brought ashore the water was pressed out of his lungs at once, his tongue was drawn forward, and artificial respiration was begun by the Sylvester method.

On my arrival, about fifteen minutes after the accident, I found the patient with markedly cyanotic face and no radial pulse. I at once gave him a couple of sharp slaps over the heart, and turned him over on his face so as to continue the artificial respiration by the Schäfer method. Within the next few minutes feeble heart-sounds could be heard with the stethoscope, and a little later a faint pulsation at the wrist could be obtained. In the meantime Dr. J. B. Austin had been sent for at my request, and from this time on we worked on the patient together, Dr. Austin confirming the subsequent findings.

At the end of about half an hour after the beginning of artificial respiration the face began to be a little less cyanotic, and three slight spontaneous respirations were obtained. Oxygen was then given continuously. It seemed as if success would ensue, but in spite of strychnin, one-thirtieth grain, and epinephrin, 10 minims of a 1:1,000 solution, being given intravenously and massaged thoroughly toward the heart, it was impossible to bring back spontaneous respiration. The heart continued to beat until two hours and ten minutes had elapsed, the artificial respiration being given for a total time of two hours and fifteen minutes, and the oxygen for the last one and three-quarters hours of that time.

This case illustrates the well-known fact that efforts at resuscitation should be used for at least two hours after apparent death, although I do not believe it is of any use to do this for so long a time in case of persistent absence of the heart-sounds as shown by careful stethoscopic examination. In this regard in another drowning case which I was called to attend a few days previously, a 14-year-old boy had had cramps and been submerged between five and ten minutes—probably nearer ten minutes than five. No heart-action could be detected and as I saw him after there had been no evidence of heart-action for about twenty-five minutes the case at once seemed to be hopeless. Resuscitatory measures had been maintained for three-quarters of an hour when a drop of ether was placed in one eye (d'Halluin). No reddening was caused, confirming the previous finding that there was no circulation. The artificial respiration was continued for an hour longer without result—really unnecessary effort in the face of two such negative tests.

The heart may continue to beat for as long a time as five minutes after cessation of respiration, although it usually stops in two or three minutes. Add to a *possible* five minutes the seven minutes during which the brain may be completely resuscitated after total cessation of the heart-beat, a *possible* maximum of twelve minutes of relative death may be undergone with recovery. If this period of twelve minutes is exceeded "recovery" may take place, but without return of consciousness, or with destruction of some of the higher centers. Moreover, if the heart does not pump a sufficient stream during the first five minutes the time is shortened. Another dangerous factor tending to shorten this time is the degree of violence with which the water enters the lungs when the accident happens.

In case preparations can be made inside of this twelve-minute limit the attempt should be made to inject epinephrin in normal saline solution into a radial artery toward the heart (Crile). In this way the coronary blood-pressure can be raised and the heart made to resume its action. Doing this on the field would mean taking chances as regards infection, but with a life at stake it would be legitimate to make the effort. The hands of the operator and the wrist of the patient could be sterilized with tincture of iodin. No anesthetic would be needed, nor could it be used if at hand. The needle, tube, reservoir and saline solution would have to be in a portable form ready for instant use.

In the case reported above, failure to resuscitate was due principally to irreparable damage having been done to the respiratory centers in the medulla by anemia. In this case there was no indication for using the saline-epinephrin intra-arterial infusion because the heart was resuscitated without doing so. The intravenous injection of epinephrin and strychnin must have been dispersed through the circulatory apparatus, but epinephrin and strychnin will not cure cerebral anemia — they merely enable the circulatory mechanism to work more efficiently.

With the exception of the Brosch-Sylvester method, the Schäfer method of giving artificial respiration gives the greatest respiratory exchange per movement of the thorax. When, in addition to this, the facts are considered that the tongue automatically falls forward, that there is free drainage from the lungs, and that long-continued application can easily be made, it is undoubtedly the best method to be used in drowning-accidents.

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The "Drug-Action" of Anesthetics.—Richard Gill, chief chloroformist to St. Bartholomew's Hospital, maintains that the "drug-action" of all anesthetics is similar; they are all oxidized in the blood into inert bodies; they deprive the red cells of their oxygen. The hot nascent oxygen of the red cells readily oxidizes them, whereas the diluted oxygen of the air does so only with extreme slowness. The red cells at first offer a resistance to this demand for their oxygen. The resistance progressively diminishes. Less and still less anesthetic is needed during a long operation as the minutes pass, and much more anesthetic is needed to break down the first resistance (induction) than is subsequently needed to deoxidize cells already beaten by the anesthetic (maintenance). The oxygen instead of feeding the body tissues is confiscated by the anesthetic; hence the "anesthetic state" is one of oxygen starvation. An oxygen-starved brain and nervous system is improperly nourished, and cannot function fully; hence unconsciousness and immobility.—J. W. Bean in *Australasian Med. Gaz.*

THE ABILITY OF MOTHERS TO NURSE THEIR CHILDREN *

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Perhaps this topic may well be opened by emphasizing the necessity for women to nurse their children, particularly as so much misconception exists regarding this, not only on the part of the laity, but of physicians themselves. I have heard expert physicians say that they have little fear of difficulty in feeding an infant artificially if only they can have the charge of it from the beginning. I thoroughly agree with the necessity of the early control by the pediatrist in order to avoid the digestive disturbances which so readily arise. The difficulty is thereby lessened, but by no means removed. I cannot share the optimistic view expressed. There may exist the man who can, under these circumstances, feed infants as successfully artificially as at the breast, but I have yet to meet him. Certainly, all statistics indicate the contrary. A few of these may be of interest.

INFANT MORTALITY AND INFANT DIET

The oft-quoted extensive studies of Eröss,[1] based on the vital statistics of thirteen European countries, covering a number of years, show that the average mortality in the first year of all children born alive is 18.33 per cent. The United States Census Reports[2] for 1890 give a very similar figure — 18.29 per cent. for the registration area. There is considerable variation in different parts of the world. According to Eröss, the mortality in Ireland is but 9.4 per cent. and in Sweden 9.7 per cent; in Saxony, on the other hand, 28.1 per cent., and in Bavaria 28.7. In Russia, according to Gundobin,[3] it is still higher, 32.6 per cent. Budin[4] reports a mortality in the first year for France from 1896 to 1900 of 20.2 per cent., and the statistics of Luling,[5] for Baudelocque's clinic de Paris, give 26.94 per cent. dying in the first year of the 13,952 children born.

That this mortality is largely dependent on disorders of digestion is a suggestive fact. Heimann[6] reports an average from 1897 to 1901 inclusive of 10,993 infants under one year of age dying each year in Berlin, over one-third of them suffering from digestive disorders. In the mortality of Massachusetts from 1892 to 1896, according to S. W. Abbott,[7] diarrheal disorders were responsible for 29.49 per cent. of the deaths in the first year of life. The six-year record for the United States ending 1890 made diarrhea responsible for 21.22 per cent. of the deaths in this period. Budin[4] found that 38.5 per cent of the deaths in the first year in the civic population of France were due to gastro-enteritis.

This brings us naturally to the next point to be considered, the influence of the diet, since it is particularly among the artificially fed infants that gastro-enteric affections prevail. We have reason to expect, then, that the mortality will be found much greater in the artificially fed. That this is the case is well recognized, but a few figures may serve to illustrate to what degree it is true. In the cases reported by Luling,[5] 14.24 per cent.

* Read in the Section on Diseases of Children of the American Medical Association, at the Sixty-Third Annual Session, held at Atlantic City, June, 1912.

1. Eröss: Ztschr. f. Heilk., Prague, 1895, xix, 371.
2. Eleventh Census, U. S., 1890, Vital Statistics, i, 22.
3. Gundobin: Jahrb. f. Kinderh., 1898, xlviii, 368.
4. Budin: Ann. de méd. et chir. inf., 1903, vii, 181.
5. Luling: Thèse de Paris, 1900, p. 18.
6. Heimann, quoted by Ebert: Jahrb. f. Kinderh., 1905, lxi, 500.
7. Abbott: Jour. Massachusetts Assn. Boards of Health, December, 1898.

of the breast-fed infants died and from 31.42 per cent. to 50.24 per cent. of the bottle-fed; and in the 10,000 infants in the first year studied by Westgaard,[8] of those that were breast-fed 17 per cent. died from gastro-intestinal diseases and of the bottle-fed 43 per cent. Of 1,000 infants studied by Armstrong,[9] in England, but 8,418 per cent. of the breast-fed died in the first year against 22.826 per cent. of the bottle-fed. In 8,329 deaths under one year of age, occurring in Munich, Frank[10] found that 86.14 per cent. of the infants had been bottle-fed. Finally, W. H. Davis[11] addressed letters of inquiry to a large number of women giving birth to children in 1910 in Boston. The 736 replies showed that only 26 per cent. of the deaths between two weeks and one year of age had occurred in breast-fed babies. Roughly speaking, we may say that the breast-fed baby has at least five times the chance of living that the bottle-fed baby possesses.

We may then assume it proved, beyond question, that the absence of breast-feeding is perhaps the chief cause of infantile mortality in the first year, as indeed of many deaths occurring in the second year. We may even go further than this and claim that the results of bottle-feeding are often much more lasting than this period. Thus Rose[12] studied 164,000 persons with relation to the later influence of the diet which had been given in the first year of life, and found that in many respects the deleterious effects of bottle-feeding were often quite discoverable in these individuals, and that even in men capable of military service the difference to the disadvantage of the bottle-fed baby was very apparent. This observation is by no means an isolated one, similar conditions having been noted by other writers.

BREAST-FEEDING AND THE CONDITIONS AFFECTING IT

With the full understanding of these facts, the importance of the next three topics to which reference must be made is pressed home on us: 1. How many mothers nurse their children? 2. How many are capable of nursing? 3. What is the cause of failure of women to nurse their infants?

The condition varies considerably with the country. In Japan, breast-feeding is the rule. In Greenland, artificial feeding is scarcely known, and, among the Esquimaux of Alaska, there is no cow's milk to be had and infants are often nursed for from two to three years. In some of the races of Africa, the mother is often helped, if need be, by any of the women of the village, previous parturition, recent or at all, not being a necessity, the secretion of milk being gradually established in virgins or in grandmothers by the repeated putting of the child to the breast.

The importance of nursing by the mother is one long recognized by writers. An interesting contribution by Schlossman[13] quotes the urgent advice given in favor of it by the philosopher, Favorinus, who lived in the time of Trajan. Unfortunately, however, in many so-called civilized countries, maternal nursing has undoubtedly decreased greatly in frequency since then. In parts of Bavaria, according to Grassl,[14] hardly 30 per cent. of the mothers give the children the breast. In Berlin, as stated by Neumann,[15] 55.2 per cent. of the infants were nursed in 1885 and only 31.4 per cent. in 1890, showing the great falling off which had occurred in maternal nursing. Further statistics could be given.

Is this failure of breast-feeding an actual inability or only an apparent one? Is there in reality a diminishing power of women to nurse their infants? This is our second question. As a result of studies in the Obstetrical Clinic of Graz, Negris[16] found that there existed in only 10 per cent. a physical disability to nurse. In the Stuttgart clinic, according to Martin,[17] nearly 100 per cent. do nurse. In Heidelberg, Jaschke[18] observed that whereas, in 1904, 64.01 per cent. of the infants were breast-fed, in 1907, 86.14 per cent. and in some months 97.22 per cent were, showing a very decided increase in the ability. In Württemberg, where formerly, according to Hegar, only 41 per cent. of the women in the clinics nursed their babies, now, according to Martin,[17] 100 per cent. were capable. Madam Dluski[20] estimated that of 500 women observed in Pinard's clinic in Paris, there were but five in whom it was certain that nursing would have been impossible either from the beginning of lactation, or after an interval of continuous effort; and Blacker,[21] as a result of studies on 1,000 children in London, could find only twenty-four, or 2.5 per cent., in whom there was a physical inability to nurse.

With regard to the frequency of breast-feeding, whether there is an actual diminution or an apparent one only, some of the figures which have been given, are, to a certain degree, open to criticism. In the first place, many of the statistics are derived from lying-in institutions for patients of the poorer classes only, among whom the conditions of life are very different from those which obtain among the well-to-do. In the second place, such statistics apply only to the first few weeks of the nursing period, during which the women are under close observation and careful diet and treatment; and we have no means of knowing how many of these women are able to continue nursing, say, for six months or more, or do so, even if able, after they return to their homes. The important matter to determine is whether there is a diminution in the actual ability of women to continue nursing, or whether the cessation of nursing is a preventable condition. Exact figures bearing on this are not very numerous. In Leipsic, according to Hohlfeld,[22] only 27.5 per cent. of the mothers continued to nurse for six months. Weiss[23] found that in 1,622 cases studied by him there were 77.01 per cent. of the infants nursed for one week and only 25.3 per cent. fed in this way for over six months. Negris[16] found that among the polyclinic clientele of Graz and its vicinity only about one-third of the mothers continued to nurse exclusively for a period averaging two months or more and that this number was diminishing. Nordheim[24] reported his experience in 1,000 women coming to the Children's Dispensary in Munich. Of these only 3.6 per cent had nursed longer than three months, and only 0.8 per cent. longer than six months. This is truly, as Nordheim says, a deplorable condition.

More encouraging are the interesting figures of Deneke and Thorn[25] who, through the aid of midwives

8. Westgaard: Die Lehre der Mortalität und Morbidität, 1901; quoted by Jaschke, Monatschr. f. Geburtsh. u. Gynäk., 1908, xxviii, 172.
9. Armstrong: Brit. Jour. Child. Dis., March, 1904, p. 115.
10. Frank, quoted by Jacobi: Gerhardt's Handbuch der Krankheiten, i, 319.
11. Davis: Boston Med. and Surg. Jour., 1912, clxvi, 242.
12. Rose: Deutsch. Monatschr. f. Zahnheilk., 1905, xxiii, 13; quoted by Ziegenspeck, Verhandl. d. Gesellsch. f. Geburtsh. ü Gynäk., 1907, xii, 829.
13. Schlossman: Monatsch. f. Kinderh., 1910, Orig., ix, 201.
14. Grassl: Soc. Med. u. Hyg., 1907, i, 597.
15. Neumann: Deutsch. med. Wchnschr., 1902, xxviii, 795.
16. Negris: Wien. klin. Wchnschr., 1905, xviii, 459.
17. Martin, quoted by Jaschke: Monatschr. f. Geburtsh. u. Gynäk., 1908, xxviii, 172.
18. Jaschke: Med. Klin., 1908, iv, 257.
20. Dluski: Thèse de Paris, 1894.
21. Blacker: Med. Chron., Manchester, 1900, Series 3, ii, 323.
22. Hohlfeld: Deutsch. med. Wchnschr., 1905, xxxi, 1391.
23. Weiss: Med. Klin., 1911, vii, 644.
24. Nordheim: Arch. f. Kinderh., 1901, xxxi, 89.
25. Deneke and Thorn: Ergebn. d. Säuglingsfürsorge, 1909, iv,

who had been in attendance, studied the later history of 32,447 infants born in the Magdeburg district in 1907, outside of maternity institutions. It was found that 83.7 per cent. of these were nursed at least for a time, and that in 61 per cent. nursing was continued for longer than two or three months. They conclude from these studies that the great majority of mothers are physically capable of nursing their children. Hegar[26] is of the opinion that under careful management 60 per cent. of mothers outside of maternities are able to nurse their infants. Kriege and Seutermann,[27] in 4,096 infants in private practice in Barmen, found 77.9 per cent. nursed for from five to six months. Koplik,[28] in 1,007 cases in private practice in New York, found less favorable conditions. Only 573 (56 per cent.) of these were breast-fed for different periods and only 40 per cent. of these 573 for longer than four months. Marfan,[29] on the other hand, estimated, as evidenced in his own practice, that two-thirds of the women of Paris can nurse satisfactorily, and in the other third there is generally a partial power to do so, a certain amount of substitute feeding being required; only 10 per cent. are actually unable.

The question, then, of the falling off of maternal feeding can be determined only partially, on account of the variation in published statistics. Undoubtedly many more women cannot nurse than should be the case among supposedly normal individuals. Undoubtedly, on the other hand, many women do not nurse who are capable of doing so under proper care.

The relative inability among the poor and the well-to-do is also a matter of interest. The general opinion appears to be that in the better classes the inability to nurse, or at least the infrequency of nursing, is seen more markedly than among the poorer classes. There exists certainly among the upper classes a large number of women who do not and often, in spite of their most earnest wishes, cannot nurse their infants. Contrary to the common opinion is, however, that of Neumann,[30] who thinks that the falling off in the capability of maternal nursing in Berlin women is seen oftener in the working classes. From the years 1900 to 1905 there occurred in that city an increase in breast feeding among the well-to-do. The small percentage of Vienna infants nursed over six months, as reported by Weiss,[23] came, too, from the dispensary class of patients.

Some of the statistics of maternities quoted are at least a clear indication of the general change which it is to be hoped is taking place. The clearly increasing number of women in some of these institutions who now nurse their children, as compared with the conditions a few years earlier, indicates that a similar increase of frequency of nursing is to be looked for in patients outside of the institutions. Certainly, everywhere among the more intelligent classes and even among the poorer, under the influence of the awakened conscience of physicians and the instruction which mothers receive from varied sources, there is a growing earnest desire of women to nurse their children, and, it would seem, an increasing frequency of maternal nursing.

This brings us to our last question. What is the cause of the diminution of breast feeding which has shown itself in many regions? Bunge[31] believes that there is an increasing actual physical inability of the mother to carry on maternal feeding, which he attributes largely to the continued use of alcohol by civilized races. Whatever the cause, there is good reason to believe that there is a physical disability to a certain extent and that this disability may be transmitted by inheritance. Most investigators, however, think that the causes of failure to nurse are to be sought rather in the unwillingness of the mother, instigated or abetted often by the advice of midwives and monthly nurses, and, I regret to say, far too frequently by physicians to make a fair effort. Hegar[26] expresses this clearly in attributing the inability to nurse to the influence of generations of undervaluing of maternal feeding. The introduction of the numerous methods of artificial feeding led easily to the conviction that nursing at the breast was an unnecessary and onerous affair. Ziegenspeck[32] points out that in Germany, where the preparation of artificial foods and food mixtures has long thriven, dating, as we know, at least from the time of Metlinger (1474 A. D.), maternal nursing has suffered proportionately.

I have, in a previous article,[33] referred to an interesting contribution by Keller,[34] which is so illustrative of the curious reasons assigned that I give it now more in detail. Although the observations were made on women of the poorer classes, the reasons in many respects are very similar to those commonly given by women in better circumstances. Keller studied the histories of 1,300 children in the Kaiser Franz-Joseph's Ambulatorium in Vienna and found that 278 or 21.4 per cent., had never been nursed at all. In eighty-two of the 278 cases the failure to nurse was on the mothers' own initiative, not through the suggestion of others. The reasons given were: "felt weak," fifteen cases; "felt ill," nineteen; "too young," one; "too little milk," but without any attempt, fifteen; "child would not take the breast," but without trial, six; "no milk," but without attempt, seven; "took bottle readily," six; "menses occurred," one; "had a severe labor," three; "pain in the breast," but child never put to the nipple, seven; "husband unwilling," two. In nineteen cases it was through the advice of the attending physician that the mother did not attempt nursing, and on the following grounds: "sick" or "weak," ten; "menses had occurred with previous child," one; "too little milk," but without trial, two; "no milk," but without trial, six. In seventy-nine cases the advice of the midwife was followed, the reasons urged being: "sick" or "weak," twenty; "too old," one; "no breast," three; "would not take the breast," but no trial made, five; "too little milk," but no trial made, twenty-nine; "no milk," but no trial made, twenty; "tender breast," one. In ninety-four of the remaining ninety-eight cases the reason for not nursing was the necessity of going immediately to work. In only 0.8 per cent. of the cases was it perfectly certain that the mother could not have nursed. Very similar results have been previously published by others, among them Nordheim[24] who found that of 1,000 women, 642 had never nursed at all, and 86.7 per cent. of these entirely without good reason.

Among the working classes, undoubtedly, poverty is a frequent cause of the desire to avoid nursing. It is often imperative for the mother to work, and she cannot well do this and attend to the infant also. In other cases lack of suitable nourishment for the mother causes a failure in the secretion of milk. The remedies for these

26. Hegar: Beitr. z. Geburtsh. u. Gynäk., 1910, xv, 201.
27. Kriege and Seutermann: Zentralbl. f. allg. Gesdhtspflg., 1906, xxv, No. 1; quoted by Schwarz, Ergebn. d. Säuglingsfürsorge, 1911, No. 11.
28. Koplik: THE JOURNAL A. M. A., Jan. 13, 1912, p. 75.
29. Marfan: Rev. mens. d. mal. de l'enf., 1902, xx, 1.
30. Neumann: Ergbn. d. Säuglingsfürsorge, 1910, v.
31. Bunge: Die Zunehmende Unfähigkeit der Frauen ihre Kinder zu stillen, Munich, 1900.
32. Ziegenspeck: Verhandl. d. Gesellsch. f. Geburtsh. u. Gynäk., 1907, xii, 829.
33. Griffith: New York Med. Jour., Dec. 4, 1909.
34. Keller: Wien. klin. Wchnschr., 1909, xxii, 635.

difficulties are to be found only in sociologic aid. In other cases it is the complete ignorance of the mother regarding the importance of breast feeding which leads to gross indifference in the matter, and this applies to all classes of society. Only constant instruction of the people can remedy this. The splendid work of the Consultations de Nourissons, founded in Paris by Budin, and established in other cities of France, has by this instruction increased the number of cases of maternal feeding among the poor by 20 or 30 per cent. Similar efforts in Meran and Stuttgart to care for the better nutrition of the mothers have, according to Ziegenspect,[32] increased their ability to nurse their children. In the upper classes there is undoubtedly often seen an inability to nurse dependent on the more highly organized and hence more easily disturbed nervous organization of the mother. Here, too, is the influence of early mental forcing, early enjoyment of social life, with late hours, and the like. With all classes the failure of intelligent management of the early nursing periods by physicians or midwives has often been sufficient reason for an early cessation of the milk secretion. Faulty methods of dressing have doubtless in the past been the cause of many hopelessly depressed nipples.

The numerous stated contra-indications to nursing are more fancied than real. Actual contra-indications are few, and physicians should learn to appreciate this fact. Here, especially, the obstetrician who is thoroughly grounded in the importance of breast feeding can be of the greatest aid, since he is so early associated with the mother and can exert a great influence on her. Certainly many obstetricians in the past have paid all needed attention to the mother, but far too little to the infant. This is a reproach often made, but one which I hope is passing away. There is, there can be, no good substitute for mother's milk and this the obstetrician should impress on the mother with all his power.

Finally, in this connection, it must never be forgotten that inability to nurse or inability on the part of the infant to digest its mother's milk can never be determined by a brief trial. It is only after prolonged and repeated, and again repeated, efforts that we can reasonably conclude that weaning is necessary. Here the fault lies with physicians, since they are, as a rule, far too ready to abandon their efforts. The mother is perhaps clamorous for weaning, and it is easy to move in the path of least resistance. Many a time the breast, which at first gives insufficient milk, will later render an abundant supply, and the infant's digestion, at first much disturbed, will accustom itself perfectly after a while.

In conclusion, I think it may be claimed (1) that the mother's ability to nurse her infant, although lessened in the past, is no longer materially diminishing, provided the woman has been raised and continues under healthy, normal conditions; (2) that these conditions are improving in the upper classes and not changing for the worse in the poorer, and (3) that the infrequency of nursing depends chiefly on the ignorance of the laity and the indifference of physicians. It is our duty as physicians to remedy these evils.

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Metal Poisons.—While it is true that most of the workers in the poisonous metals are warned of their danger, my experience with them is that each man usually thinks he will prove an exception to the rule, and like the coal-miner long accustomed to deal with fire-damp, finally forgets the danger and courts disaster.—Thompson in *Jour. Maine Med. Assn.*

SUPPLEMENTAL BREAST-FEEDING IN INFANTS *

H. M. McCLANAHAN, M.D.
OMAHA

Vital statistics have abundantly demonstrated the following facts:

1. Mortality is greater during the first year than at any other time of life, and higher during the first three months of life than during any other period.

2. Mortality and morbidity are higher among bottle-fed than among breast-fed infants. This is the testimony of writers on diseases in children. As there is no evidence that breast-fed infants receive better care than those reared on the bottle, it is evident that the only reason for the greater mortality in bottle-fed infants is due to the nature of the food. The reasons for the difference in mortality may be briefly summarized as follows:

A. The milk of the mother is adapted by nature to the peculiar needs of the human infant, just as the milk of other mammals is peculiarly adapted to their offspring.

B. It contains all of the elements necessary to the growth of the various organs and tissues of the infant's body. In the order of nature, the milk of other mammals is not adapted to the digestion of the human infant.

C. Breast-milk is received by the infant in its natural state unchanged by cooling or agitation or the separating of its constituent elements.

D. It is a vital fluid, as it enters the stomach, stimulates the digestive secretions and is assimilated with less waste and induces less exhaustion of the vitality of the infant than any prepared food. Hence, there is less expenditure of vital energy in the digestion of mother's milk.

E. Under normal conditions it is a sterile fluid and is carried to the infant's stomach in a sterile condition.

F. It is ingested at an even temperature, namely, that of the body, and is at once ready for the action of the digestive ferments.

G. It contains certain protective principles that confer an immunity to the infant, and greatly lessens infant morbidity.

REASONS FOR INCREASE IN BOTTLE-FEEDING

While the above facts are common knowledge among students of medicine, they are not duly appreciated either by physicians or by the laity. There is an increasing number of infants being reared on the bottle. It is believed, and no doubt correctly, that the chief reasons for this increase in bottle-fed infants are:

The influence of manufacturers of infants' foods. We must admire the systematic method employed in exploiting the merits of the various foods, and we cannot believe that extensive and expensive advertising would be continued, even to the mailing to expectant mothers of handsomely illustrated booklets containing specific directions for preparing the food, if it were not a paying business.

Improved methods of infant-feeding. During the past twenty years there has been an immense volume of current literature on feeding, not only in medical journals but also in popular publications, and both the medical profession and public have come to believe breast-feeding neither essential nor important to the welfare of the infant. On the contrary, breast-feeding has received

* Read in the Section on Diseases of Children of the American Medical Association, at the Sixty-Third Annual Session, held at Atlantic City, June, 1912.

scant attention; indeed no other physiologic function of the human body has received so little study as breast-feeding. Granting that immense progress has been made in artificial feeding, it yet remains true that the best artificial feeding will not equal breast-feeding.

My limited study of this subject leads me to the conclusion that among both the medical profession and the laity, the belief exists that a mother either can or cannot nurse her infant. As Southworth has said, "Milk either comes into the breasts abundantly and is good, or it comes in scantily and is useless." It is the practice, if the mother does not have sufficient milk adequately to nourish her baby, forthwith to place it on the bottle. Now the question I wish to present for consideration is this: Is there no middle ground between entire breast-feeding and bottle-feeding? If the mother has a partial supply of milk why should this be discarded? Is not some breast-milk better for the infant than no breast-milk? The arguments I have presented for breast-feeding apply almost equally to partial maternal nursing. Supplemental feeding is not only simple justice to the helpless infant; it is, I believe, beneficial to the mother. It relieves her from the drain, if the milk is scanty; it affords her wider personal freedom and while it may sound sentimental, I believe it nevertheless true that breast-feeding stimulates the maternal instinct, and enhances affection for the offspring.

Granting that the infant can be reared on the bottle and survive its first year, is that all? What about the morbidity of bottle-fed infants? Is it not the general experience that many bottle-fed infants suffer from various forms of indigestion, anemia and other diseases of nutrition, as scurvy, rickets, malformations and general infections, that increase mortality in subsequent years?

I have no statistics to offer, but this is my personal experience. I have been giving this subject study for more than five years and during that period have made it a rule in my office work to ask the question whether or not the patient was breast-fed or bottle-fed. If the reply was that the infant was bottle-fed, I have endeavored to ascertain the reason. As the result of these inquiries I have gathered, from 400 mothers who have reared their infants on the bottle, the following information:

Only fifteen mothers out of the 400 replied that they positively refused to nurse their infants. Three hundred and eighty-five replied that they would have nursed their infants had there not been some reason to the contrary. Twenty of this number stated that they were seriously sick following confinement and for that reason could not nurse their infants. A number were compelled to wean their infants because of retracted nipples or fissured nipples or mammary abscess, and a total of 108 made a failure of breast-feeding during the first two weeks after confinement. In about 250 cases the mother said that she had weaned her baby because it was starving or crying or her milk was not nourishing or that she did not have enough milk to supply the infant. In reply to the question "Did your physician advise mixed feeding?" not more than ten gave an affirmative answer. I was impressed with the fact that the majority replied that they had never heard of such a thing as mixed feeding. To the question "Did your physician examine the breast-milk before advising you to wean the infant?" the answer was negative in all but three cases.

It is my conclusion that supplemental feeding is not appreciated either by the profession or by the laity. This suggests the question "Does supplemental feeding offer any advantage or is it better or safer for the infant than entire bottle-feeding?" As I have already indicated, there is but one answer to this question, but as the experience of any one individual is too limited to have any great value the question can only be answered by the combined experience of many observers.

I am firmly convinced that mixed feeding is almost as beneficial to the infant as entire breast-feeding, and I desire earnestly to protest against the fallacious doctrine of weaning the infant entirely because of insufficient supply of milk or of poor quality of milk or any other reason except some organic disease in the mother. I would urge with all possible emphasis the adoption of mixed feeding in all cases in which there is a deficient amount of milk, and in cases in which the supply of milk is abundant but the mother's health seems to suffer in consequence. In these cases I am sure it will be found that supplemental feeding will be of benefit to the mother. In cases in which the supply is sufficient but the quality deficient, as ascertained by simple examination of the milk, it is a simple matter to supplement the breast-milk with a modified milk that will make up the deficiency in quality. It is a mistake to think that any preparation of milk will do in mixed feeding. I am sure failure results from want of attention to this phase of the subject.

RESULTS OF SUPPLEMENTAL FEEDING

I wish to report fifty-six cases of supplemental feeding under my care during the last five years. In this series of cases I have had the privilege of directing the mother at intervals during her nursing period. I freely confess to a number of failures during the same period, but I believe most of them were due to my inability to secure the confidence of the mother. In my judgment to attain success, it is essential to have the cooperation of the mother. The best way to secure her cooperation is to convince her of the value of the method—that it will not only save her strength but increase the life prospect of her infant, improve its nutrition and confer a relative immunity to disease. It is important also that the mother should receive proper medical advice as to her general health.

In my experience there are two important difficulties to be encountered and overcome in mixed feeding.

1. The infant tends to wean itself from the breast. This is the first real serious problem to be met, and without firmness and obedience on the part of the mother, failure will result. In some cases it will be necessary to let the baby go hungry for hours. In one case the baby had nothing but water for twenty consecutive hours. It then took the breast and never after was there any serious trouble in this case. Each time the mother weakens and gives the bottle but increases the difficulty. In fact, most failures occur as a result of this tendency.

2. Lessening of the quantity of milk. If the breasts are not nursed regularly they tend to cease secretion, and also in my experience the milk is of a poorer quality. The use of the breast-pump is a poor substitute in stimulating the secretion.

I have found that the safer plan is to give but one entire bottle a day. This bottle is usually given at 6 or 10 p. m. This rule permits the mother to have an evening out, without feeling that she is in any way neglecting her infant. At other times the baby is to

have the breast, the time varying, owing to the condition of the gland. As soon as the mother feels that it has become soft, the infant is taken away and given the bottle. It is a mistake to permit the infant to strip the breast. This practice is wearing on the mother and likely to induce indigestion in the infant. I have found from experience that ten minutes is usually ample time to keep the baby at the breast. My rule is to let the baby nurse the bottle until it is satisfied. Of course, the quantity will vary owing to the amount it gets from the breast. No rule can be given, but I always have an ample quantity of modified milk prepared. It is my observation that the food should not be too sweet. I have repeatedly observed that when the infant is given condensed milk, there is greater danger of its weaning itself from the breast.

The small amount of prepared food required to cause a gain in weight is surprising in some cases. One of my patients, an infant aged 4 months, had not gained for three months. I was called to advise concerning weaning the baby. In that case the addition of one bottle each evening of 5 ounces caused a gain during the first week. I have frequently observed that supplemental feeding improves the health and general comfort of the mother. In some of my cases the mother would frequently go for several days without giving any bottle. Another advantage is that if the mother feels that she is not quite up to the standard, or that the infant is not gaining normally, bottle-feeding can usually be increased.

These fifty-six mothers were from all walks of life. Several were wives of laboring men who were compelled to discharge arduous household duties, including washing and ironing. In all these cases the mothers appreciated greatly the relief given by mixed feeding. Three of them were women who were compelled to work all day and to be away from the infant. Two of them found it necessary to pump the breast two or three times a day in order to keep up the supply. Not one of the fifty-six infants were seriously sick during the nursing period. Three developed pertussis, but recovered. All made a satisfactory gain in weight. The mothers were satisfied with the method of feeding, and a number ceased nursing their infants with regret. As a result of my experience and observation, I submit the following conclusions.

CONCLUSIONS

1. Unless the mother is suffering from some serious disease, she should nurse her infant.

2. Many failures in breast-feeding occur during the first two weeks, often from preventable causes.

3. It is an unjust aspersion to assert that the mothers refuse to nurse their infants. The majority of mothers will nurse their infants if they realize that it is important.

4. The responsibility for bottle-feeding rests largely on the medical profession. If all physicians believed in breast-feeding and would use their influence with the mothers, there would be few infants reared entirely on the bottle.

5. Supplemental feeding provides the infant with the vital elements of breast-milk, and to that extent lessens mortality and does not injure the mother's health.

6. Supplemental feeding requires an intimate knowledge of the various modifications of cow's milk, and necessitates complete cooperation between mother and physician.

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ABSTRACT OF DISCUSSION

ON PAPERS OF DRS. GRIFFITH AND M'CLANAHAN

DR. DAVID E. ENGLISH, Summit, N. J.: I have used a plan, which has proved very satisfactory. When the mother's milk is scanty and there is not enough to satisfy the baby, I have her nurse the baby and feed it at the same time; that is, put it from one nipple right on to the other. I have two reasons for this; one is that I think the baby's stomach should be filled up when fed, so that it does not have to be fed so frequently. The other is that it gets the mother's milk mixed with the modified milk, and gets the action of the ferments in the mother's milk—what Dr. McClanahan calls the vital principle. There are three ways in which this may be done; one is to feed the baby modified milk before he is put to the breast; in doing this we have to find out by experiment how much modified milk to give him. Another is to give the breast first. Some babies refuse modified milk after the appetite has been half satisfied with mother's milk. A third way is to give a little modified milk first and then breast-milk, and then, if the baby will take any more, finish up on modified milk. By using these little tricks, I have not only been able to keep the mother's milk going and the baby well nourished, but also to help it to digest the modified milk better than it would otherwise.

DR. HENRY J. GRAMLING, Milwaukee, Wis.: When I find a mother who cannot nurse her baby the first thing I do is to put the baby on modified milk at night. If the mother's milk is scanty and she has to get up at night, she will not have enough nourishment for the child the next day. If the mother is nervous it is wise to take the baby away from her altogether at night, so that her sleep will not be disturbed. Persistence along this line is usually rewarded with success.

DR. THOMAS S. SOUTHWORTH, New York: Aside from the fact that breast-milk is more readily digested, it has always seemed to me that one of the reasons children do so much better on breast-milk is that the average child at the breast requires less supervision than a child on the bottle. Bottle-feeding must be constantly changed and modified in order to adapt cow's milk to the child's needs during its first year. Nature does what adapting is necessary in the breast-milk. I do not, however, consider that the breast-fed child should be allowed to go without proper supervision on the part of the physician, and I believe that a great many of the failures to nurse successfully are due to the fact that the mothers are left to their own resources. I am glad Dr. Griffith used the expression "awakened conscience of the physician." Others have spoken here of the fact that we as physicians have been largely responsible for the decadence of maternal nursing. It is my experience that the man who readily advises a mother to wean her baby and put it on artificial feeding is, as a rule, an unsuccessful artificial feeder.

I am a little afraid that someone might misunderstand Dr. McClanahan when he quoted me as saying that, "either the breast-milk comes in abundantly and is good, or it comes in scantily and is bad." That is the popular opinion, giving rise to the opinion that if the milk is abundant and good one can continue with it, and if it is scant and bad one must stop it. The latter is not my deduction. I do not believe that there is very much bad breast-milk; there is scanty milk, and sometimes it is lacking in a sufficient quantity of fat. When a mother tells me that her child has been removed from the breast because it was having green stools and the doctor said her milk was poisoning it, I know that that doctor was on the wrong track. There are instances when the maternal milk is poisonous, but they are extremely rare. I do not care much about elaborate examinations of the breast-milk. I use the Holt apparatus chiefly to find the amount of fat, but we can be misled by the analysis of the milk. I think that we should pay less attention to analysis and more attention to building up of the general health of the mother, in which case the quality of the milk usually takes care of itself. I think that if we increase the number of suppiemental feedings, more than one or two daily, we tend to decrease the stimulation of the breast, and the child gets less breast-milk; for

this reason I then have the child nurse at both breasts during each nursing.

As Dr. McClanahan said concerning his cases of pertussis, through which several children passed successfully, breast-feeding is one of the greatest protections to the child, not so much in making it less liable to infectious disease as in enabling it to withstand infections.

DR. HENRY L. K. SHAW, Albany, N. Y.: Those of us who have had experience in institutional feeding find that many lives are saved by simply giving one breast-feeding in twenty-four hours. At the Infants' Hospital, with which I am associated, the board of managers authorized the employment of two wet-nurses. Five or six babies are often nursed by one wet-nurse, who gives each baby one or more nursings in the twenty-four hours and the results are marvelous.

The benefits of nursing the baby for a certain time and then finishing with a bottle-feeding have been brought clearly before the profession by Dr. Southworth. He coined the term "complemental feeding" when the breast is followed by the bottle. When the entire breast-feeding is replaced by bottle-feeding, the term "supplemental feeding" is employed.

I want to protest against Dr. McClanahan's statement that the breast-pump does not stimulate the breast. A concrete case will illustrate what I mean. About four weeks ago a mother brought her baby to my office with the following history: The baby was 5 weeks old and had been exclusively breast-fed for two weeks. Since then she had been fed on several formulas and prepared foods and had lost in weight. The mother had plenty of milk but because the baby had colic she had been told to wean it by her physician. She still had plenty of milk and used the breast-pump once or twice a day to relieve herself. Analysis of the milk showed practically no fat. She was ordered to stimulate the excretion of milk by pumping regularly every two hours and massaging the breast. In a week there was 2.5 per cent. of fat and a few days ago it was over 3 per cent. The baby is now nursing regularly and gaining, although it is having two supplemental feedings of modified milk.

DR. FRANK S. CHURCHILL, Chicago: At the Children's Memorial Hospital in Chicago we always keep one wet-nurse; throughout the summer months, two wet-nurses. The results are much better with them than without. We do not feed one particular baby with breast-milk, but get as much breast-milk as we can and divide it up among the different babies, giving to each baby perhaps one, two or three feedings in the twenty-four hours; the other feedings are of modified cow's milk. We all know that if a baby has ever so small an amount of breast-milk during the twenty-four hours, it can take a higher percentage of the elements of cow's milk than when on cow's milk alone. Our experience has been that the breast-pump is very stimulating to the breasts of these nurses, and with it we get large amounts of milk. That and the regular hygienic life which the nurses lead give very satisfactory results. They come in giving, as a rule, small amounts. They are put on a regular diet, lead an almost perfect hygienic life and the result is a great improvement in their general condition. We do not believe it is fair to a wet-nurse to put to her breast the babies in the hospital, because we never know how many of those may have congenital syphilis, so we have the breast-milk pumped out and fed to the baby. This apparently has a very stimulating effect. The woman soon begins to secrete much more milk than on entering the hospital, and in some instances marvelous amounts are secured. Our maximum amount was secured from a wet-nurse, a primipara, who gave during the twenty-four hours for a matter of several weeks 5 quarts of milk a day. You may ask how we know. By the method I have just detailed it is quite possible to know exactly the amount of milk we are feeding our babies in the ward. We were feeding to those babies a little over 4 quarts of milk in twenty-four hours. The wet-nurse was in addition nursing her own baby. I had that baby weighed before and after nursing for quite a number of times in order to get the average amount. That totaled to a little over a quart.

DR. COLLINS H. JOHNSTON, Grand Rapids, Mich.: We often find difficulty in getting wet-nurses. Being near Chicago, we can sometimes get one there. Last summer we saved the lives of a number of babies by securing a woman who could spare 8 or 10 ounces or a pint of breast-milk a day. In hot weather this is a great boon to the babies.

Several of the speakers have referred to the fact that wet-nursed infants are stronger and more vigorous at the end of the first year of life than the bottle-fed babies. Last summer while in Berlin I learned of the results of an investigation along this line which are exceedingly interesting. The investigation included 176 families. Twenty-four of these families with 109 children, all breast-fed, at the end of five years of married life had lost no children, while every one of thirty-three families whose children were all bottle-fed at the end of five years had lost one or more children. The results were especially interesting in families in which some of the children were breast-fed and some bottle-fed. In one group of twenty-nine families with eighty-five breast-fed children and 109 bottle-fed children, at the end of eleven years all of the breast-fed children were alive while 57 per cent. of the bottle-fed babies were dead. In another group of thirteen families with forty-eight breast-fed and twenty-three bottle-fed babies, the former were all alive and healthy while the bottle-fed babies were all dead.

DR. GEORGE D. SCOTT, New York: It is very interesting to know the conditions which underlie breast-feeding and bottle-feeding. Those of us who have seen the peasant women of Europe, particularly in the southern part, feed their children any place by simply exposing their breasts and nursing the child, and who have seen our own women try hard to nurse their children without being able to, will see the condition underlying this whole question of bottle-feeding. Those of us who try to use the bottle a great deal, who try to give food and find it inadequate, cannot help feeling that breast-feeding is at all times the best. The underlying cause or condition is psychic. If you go into the psychic condition of a woman's mind, if you let her know that her child can be bottle-fed without any responsibility to her and no exertion on her part, and no self-denial in food and social pleasures, you will be obliged to put that child on the bottle. If, however, on the other hand, you make that woman feel and instil into her mind the fact that breast-feeding is best, and that bottle-feeding is only supplemental to breast-feeding, you will, I think, make her try harder to nurse her child. Those of us who work among the poor and lowly, I think, have tried hard to make mothers feed their own children, with more or less success. By encouraging bottle-feeding we do humanity great harm.

I want to make a protest against the attitude of the obstetricians, who think they can feed the child maybe from birth. They feed it sometimes for two or three months, and when the baby is in a poor condition they throw it on us. I object to the obstetrician feeding children over one or two weeks. I think then only the pediatrist should control them.

DR. T. L. HARRINGTON, Milwaukee, Wis.: It seems to those of us who do not spend all our time on diseases of children that a most important question has arisen. Two of the speakers have referred to supplemental feeding. They put the child first on one breast and then on the other, and if necessary give the child the bottle in addition. The point is to find out in what way we can have the mother give the greatest portion of the necessary food in order that the child may gain constantly and steadily. It is a question of how we can get the best work from the mammary gland. It seems to me from my study of the matter that it is a mistake to put the child first on one breast and then on the other and then on the bottle, because you do not give the mammary gland the best chance to do its work. A healthy mother who has sufficient milk for her child nurses first on one breast and then on the other, giving each gland a rest of from four to six hours. Yet you would take a mother who has a limited supply, and tease out a small amount from each mammary gland, and only give each gland a rest of from two and a half to three hours. I believe that the best results will be obtained, and that supplemental feeding will be at the lowest amount if the mother nurses from only one breast at a time, giving each breast a considerable rest in order that it may attain its highest

physiologic power, allowing the child to nurse for from ten to fifteen minutes; then after that and in addition, put the child on the bottle if necessary. I say after and not before, because if you put the child on the bottle before, you are not in a position to take advantage of the increasing quantity of milk which that breast may be secreting if you are managing the case correctly and giving the mother proper rest and nourishment.

DR. CHARLES DOUGLAS, Detroit: It seems to me that the impression has been left that every woman can nurse successfully if we only manage her properly. There are certain conditions under which it is impossible to do successful nursing. It is not the putting of a certain amount of liquid into a child's stomach that makes success. You must have a successful result. Some women cannot nurse successfully no matter what they do. They have milk, but it does not produce a good effect on the child. What can we do with such a patient? Regulate her diet and give her rest, which is an absolute necessity. After this is done and we find that the child still has green, ropy stools, I contend that it is an error and an injury to persist in giving even one or two feedings of that milk in each twenty-four hours. I am heartily in accord with all the recommendations for giving one feeding when it can be done properly. It is nonsense to talk of giving a child breast-milk simply because the mother produces it. We must know that what we are getting from that mother is right. She must have good nourishment, rest, a limited amount of labor, etc., to give a good secretion. If then the milk fails to produce a good yellow stool, I think that mother's milk should be laid aside and the child put on modified milk. One feeding a day of mother's milk, when it is the right quality, no matter how small, is beyond price. There is nothing we can purchase which approaches it in value to the infant.

Obstetricians certainly have been doing a great deal of careless work in caring for infants. I will go a step further also and say that we are responsible in a large measure for the crude, negligent work being done by midwives and the harm that results. Our attention should be directed toward making midwives more efficient, so that they can do better work.

DR. FRANCIS P. DENNY, Brookline, Mass.: There is one argument in favor of supplemental feeding which Dr. McClanahan did not mention and that is the advantage to the child of starting cow's milk early and gradually, thus accustoming it to the albumin of the cow. If a child has to be weaned suddenly, that child is in a better condition to be weaned if for months it has been having at least one bottle of cow's milk a day.

DR. JOHN ZAHORSKY, St. Louis, Mo.: I think it is wrong to condemn physicians generally. Most physicians do try to keep the baby on the breast, but there are a great many conditions about breast-feeding which, unfortunately, we do not understand, and we might just as well admit it now. In the first place, we have the condition of dyspepsia of young infants. The baby has bad stools, continued flatulence, gets colic as soon as it nurses a drop from the mother and screams day and night. The dyspepsia in young infants is attributed to various causes; bacteria, underfeeding, overfeeding, and what not. The truth of the matter is that we know nothing about it. It is not too high fat or too high proteid, because in many cases which I have attended, at least to my own satisfaction, I have not found excessive fat or excessive proteid. Disturbances in a young infant will often lead the mother to put the baby on the bottle, because the baby is suffering and we cannot relieve it. Diminished milk-supply is the case in a great many healthy, well-to-do mothers. They try to nurse their children, but they have not enough milk. Some mothers of fine, healthy appearance give only 1 or 2 ounces of milk, and they are not able to increase the quantity after trying in every way. Another reason why some women do not nurse their babies is a painful sensation when nursing. This may come from infected breasts. Quite a large percentage are due to this cause. How can we prevent sore nipples? Then there are some mothers who have a disagreeable sensation when nursing the baby. I think there is a definite pathologic condition in these cases, and they should be studied.

We say, "Keep them on the breast," but as a matter of fact we all give the bottle very soon. We either replace the breast-feeding or add to it. We have to, for if we did not the other doctor across the street would.

DR. JULES M. BRADY, St. Louis: It should be emphasized here that it is not always a paucity of the natural food which leads to artificial feeding. Many infants sicken as the result of overfeeding on the breast. The condition is not correctly interpreted and, as a result, artificial feeding is instituted.

SOME CASES OF HYSTERIA PRESENTING SYMPTOMS USUALLY FOUND ONLY IN ORGANIC DISEASES *

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RICHMOND, VA.

In the presentation of a paper with this title I fully realize that I am treading on dangerous ground. The subject is of great importance, however, in that distinguished and trained neurologists have differed, for instance, as to whether the Babinski phenomenon, absent knee-jerks, incontinence of urine and feces, ankle-clonus and other usual signs of organic disease are ever found in hysteria.

In remarking on this I shall only quote a few statements gathered here and there from the literature on the subject. Mills[1] thinks that true astereognosis, loss of the sense of position, true ataxia and hemianopia are not found in hysteria. Purves Stewart[2] states that in hysteria absent knee-jerks, incontinence of bladder and rectum and the Babinski phenomenon never occur. Babinski himself says that hysteria itself is incapable of modifying tendon-reflexes. Dana[3] says that the sphincters are never involved except temporarily or through some complication. Incontinence of feces never occurs, according to Grainger and Stewart.[4] Philip Coombs Knapp[5] gives an excellent biography of the reflexes in hysteria and says that the Babinski and Oppenheim reflexes are never caused by hysteria. Tendon-reflexes may be exaggerated within normal limits. Whether hysteria can give rise to ankle-clonus or loss of knee-jerks is doubtful. Knapp also says that total paralysis and total anesthesia on one side are very rare. He says that Crocq[6] believed he had found ankle-clonus and patella-clonus in hysteria, and was supported by Charcot, Sachs, Oppenheim and others; and loss of knee-jerks has been found by Steiner, Marye, Nonne, Wigand and Charcot. Complete absence of plantar reflexes has been noted by Knapp and other observers. Mills[1] states that Van Gehuchten has reported one case with the Babinski phenomenon and ankle-clonus which disappeared in a few days. In commenting on this he says: "One case, however striking, is not sufficient to contravene the testimony of scores of other well-studied cases."

The whole outcome of a case may thus hinge on the view we take of one or more of the signs or symptoms

* Read in the Section on Nervous and Mental Diseases of the American Medical Association, at the Sixty-Third Annual Session, held at Atlantic City, June, 1912.

1. Mills, Charles K.: Jour. Nerv. and Ment. Dis., 1909, xxxvi, 407.
2. Stewart, Purves: Diagnosis of Nervous Diseases, p. 365.
3. Dana, Charles L.: Text-Book of Nervous Diseases and Psychiatry, p. 553.
4. Grainger and Stewart: Text-Book of Nervous Diseases, p. 539.
5. Knapp, Philip Coombs: Jour. Nerv. and Ment. Dis., 1910, xxxvii, 93.
6. Crocq: Rev. neurol., 1904, xii, 1069.

found. Hysteria, indeed, is a disease which has caused so much controversy that it is our duty to clarify our conception of it as much as possible. As in neurasthenia, the present-day methods have done much to lessen the frequency of the diagnosis of hysteria by the neurologist. Since we have recognized and classified dementia praecox, manic-depressive insanity, the anxiety psychoses, psycholepsy and others, we have fortunately narrowed the conception of hysteria.

The cases to be mentioned here are not reported in full because this is deemed unnecessary and would add too much to the length of the paper. These cases were frankly hysterical, however, as careful examination and subsequent observation proved.

CASE 1.—*Hysteria with Pseudo-Aphasia.*—The patient was a mulatto woman about 55 years of age, a member of a neurotic family. The patient gave the history of frequent hysteric seizures during the course of her life from puberty. In October, 1908, on the anniversary of her wedding day, she was taken with a right hemiplegia without facial involvement and without unconsciousness. It was accompanied, however, with great difficulty and slowness in speech. There were areas of analgesia and anesthesia on the right leg and neither the right leg nor the right arm could be moved voluntarily. Slight pressure over the left ovary made her flex her right knee about 45 degrees and the right arm about 90 degrees to the great surprise of her family. By one treatment with a strong faradic current she was made to talk better, to put the right hand to her face and to walk. She shortly recovered. Investigation developed that the patient's husband nine months before had a cerebral hemorrhage with paralysis of the right side and aphasia and had died after a short illness. The onset of the patient's symptoms resembled exactly those of the husband except that she was not completely unconscious. The interesting point about this case is the hysterical hemiplegia with a pseudo-aphasia, which complicated the picture.

CASE 2.—*Hysteria with Temporary Loss of Sphincter Control.*—The patient, a young white woman, aged 17, was seen during November, 1907. This patient had been married when 13 years of age, borne a child when 14 and had used quinin to produce abortion of a 5-months fetus three months before she came under observation. She was emaciated to such a degree as to suggest progressive muscular atrophy. Her hands had a claw-like appearance at first but she could move all of her fingers normally. There was marked contraction of the lower extremities, especially at the knees. Careful examination for organic signs or symptoms was negative. Areas of anesthesia were found on the left upper extremity. The patient appeared so ill that no eye examination was attempted at this time except that the pupil reflexes were found normal. For a few days the patient voided urine and feces involuntarily. With careful nursing she gained flesh and with massage and stretching her limbs were straightened. She had no further trouble with incontinence and in a few months was well and at home doing her usual housekeeping. To determine if spinal anemia accounted for the loss of sphincter control a blood examination was made, which was negative. The patient's hemoglobin was 62 per cent. and her red cell count was 4,500,000. The interesting point about this case is that the patient had incontinence of urine and feces without blood changes or other signs or symptoms of organic disease. The regain of sphincter control was permanent. The loss was due evidently to simple but great functional body weakness.

CASE 3.—*Unilateral Hysteric Amblyopia.*—The patient, a white girl aged 16, seen Sept. 9, 1909, developed hysteria, owing, it was thought, to overwork at school and a love affair. She complained of not having been able to see out of the right eye for a week past. Dr. John P. Davidson made an ophthalmologic examination and diagnosed unilateral hysteric amblyopia. Hysteria was confirmed by the history of hysteric seizures, sensory changes and pseudoclonus. By suggestion she was made to read large type with this eye the first day, medium type the second day and small type the third day, after which she had no further trouble. The interesting point about this case is, of course, that the amblyopia was unilateral.

CASE 4.—*Hysteria in Which the Knee-Jerks Were Absent.*—The patient in this, the last and most important case to be mentioned, was a young married white woman, aged 19, seen during July, 1909. She had given birth to a healthy child six weeks before. Her marriage was a runaway match with a man who drank to excess and who treated her with extreme cruelty. The patient had just separated from her husband. She gave the history of infrequent hysteric seizures in the past. Two weeks before she was seen she had been paralyzed in the right arm. When first seen she had loss of power in the right leg, having suddenly regained power in the right arm. Examination showed contracted vision fields, complete anesthesia of the right leg from the hip down, including the foot, and areas of anesthesia on the left leg and also over the back. Hoover's sign showed the paralysis of the right leg to be hysteric in type. There was, however, absolute loss of both knee-jerks both without and with reenforcement. Believing the case one of hysteria, and not being willing to give up the diagnosis on this symptom, I tested the knee-jerks of the patient's mother and found them absolutely absent, even with reenforcement. The mother, who gave no other symptom of brain or cord disturbance, stated that seven years previous she had been told at Johns Hopkins that her knee-jerks were absent. The patient's sister, aged 11, was tested and found to have knee-jerks. A first cousin on the maternal side, aged 7, was then tested and knee-jerks were found to be absent even on reenforcement. No other members of the family could be tested.

The diagnosis of hysteria was made, and with suggestion and several faradic shocks the patient was made to walk. The anesthesia cleared up within six days and the patient has remained well. This case is interesting because the absence of knee-jerks was accounted for as a familial phenomenon and was in all probability congenital.

Other less striking cases could be mentioned, but these are possibly sufficient to illustrate the point.

The above cases are given in brief outline, not with the intention of trying to prove that in hysteria organic signs and symptoms may occur as part of the symptom-complex and manifestations of the disease *per se*, but to call attention to the fact that definite or apparent organic symptoms may occur as a complication. To illustrate: A beautiful piece of tapestry was recently found by an art-buyer which appeared genuine and old, except that the general picture was complicated by glass beads being inserted in the representation of a piece of jewelry where diamonds should have been embroidered. The piece was rejected. Later it was found by closer observation that these glass beads had been sewed on by a child over the embroidered diamonds and the piece was thus proved genuine and was sold at a great price. The picture of hysteria may be genuine with an incongruous symptom inserted and if this symptom is not thoroughly investigated and taken out of the picture we are liable to reject the case and believe it not genuinely hysteric.

208 East Franklin Street.

Whooping-Cough.—Any disease which kills 10,000 children per annum is a serious one. If bubonic plague were to kill that many children in the United States in one year, the whole world would quarantine against our country. A child dead of whooping-cough is just as dead as a child dead of plague. A child whose body is weakened by disease is a potential economic loss to the nation. Whooping-cough is a danger to be avoided and combated in the interest of humanity and the citizens of to-morrow.—W. C. Rucker in *Pub. Health Rep.*

THE RECIPROCAL INFLUENCES OF MORBID CONDITIONS OF THE MOUTH, JAWS AND GENERAL ECONOMY *

M. I. SCHAMBERG, D.D.S., M.D.
NEW YORK

Much has been written in recent years relative to the unhygienic mouth as an etiologic factor in systemic disease. In fact, a wave of enthusiasm has been created so that oral cleanliness as a prophylactic measure against disease is receiving earnest attention both here and abroad. The municipal appointment of dental examiners in the public schools, in many parts of this and other countries, is evidence of the interest that has been manifested in the care of the mouth and teeth. Great credit is due the dental profession for this important step in the right direction, for its members have been mainly instrumental in bringing it about. The medical profession has likewise been a factor in proving to city officials the need for this advance in the protection of public health.

There is, however, much to be done to establish in medical, dental and lay minds a knowledge of the tremendous bearing that certain mouth and jaw diseases have on the general health and, furthermore, the manner in which many disorders can be early detected by a careful examination of the mouth. I will not dwell on the fact that many persons are rendered more susceptible to disease by the lowered vital resistance created by tooth, mouth and jaw troubles. This is too evident to all who give the matter any thought, but I want to lay stress on the frequency with which patients under treatment for mouth troubles are permanently cured of deviations from the normal which originally appeared to have no relation to the local lesion within the oral cavity. It is equally true that many systemic disorders are either directly or indirectly responsible for morbid conditions of the mouth and jaws.

The time-worn custom of physicians of asking to see the patient's tongue is indicative of the manner in which the oral mucous membrane in its varying condition of health and disease reflects primarily the state of the alimentary tract, secondly, the presence or absence of febrile conditions and, thirdly, circulatory changes. In certain maladies, examples of which are scarlet fever and syphilis, the tongue may exhibit as definite indications of the disease as are found in other parts of the body. In cerebral, meningeal and nervous disorders the tongue may again give enlightenment and thus be a prompt means of arriving at an accurate diagnosis. During convalescence from many diseases and in fact when the patient's life is in the balance between death and recovery, the tongue, if its readings are properly interpreted, may aid in encouraging the family or preparing them for the worst. So the tongue during the course of disease may materially aid in determining the prognosis.

The lips of the patient are occasionally studied by careful and observant diagnosticians, mainly, however, to note conditions of impoverished blood or types of anemia, as is the everted eyelid for the study of the conjunctival lining. Occasionally a definite lesion on these parts may be sufficiently evident to attract attention.

How very unusual is it, however, for physicians to make careful observations into the conditions of the mouth as a whole, to determine the presence of lesions on the mucous surface of the cheek, the floor of the mouth beneath the tongue, the palate, the gingival margins of the gum, or the roof and floor of the vestibule of the mouth. These parts to the stomatologists impart even greater information at times than do the tongue or lips. Just as does the dark line in lead-poisoning exhibit itself, so do other changes in peripheral circulation leave their mark. Faulty metabolism, auto-intoxication, rheumatism, gout, anemia, diabetes, renal, cardiac and pulmonary diseases all show their ill effects on the gingival border of the mucous membrane and often before symptoms are sufficiently pronounced in other parts to cause the patient to consult a physician.

It is no unusual occurrence in my practice, and no doubt my experience conforms to that of many who specialize in the treatment of diseases of the mouth, for me to refer to the family physician patients who on examination of the mouth are found to be in the incipient stage of one of the many maladies aforementioned. Indeed, I have occasionally found a patient to be in the throes of a well-advanced illness of no trivial character. In several instances, the true cause of what appeared to be an ulcerative or gangrenous stomatitis was recognized as the dreaded oral manifestation of leukemia only after I had insisted on a blood examination.

The vast majority of oral and even dental disturbances are markedly influenced by the state of the general health of the patient. In such extreme instances as osteomalacia, rachitis, and even the normal process of pregnancy do the mouth and teeth suffer with the rest of the system the drain on the osseous structures. In most diseases of the dermal covering of the body the prototypes of their lesions can be seen within the mouth, and here, owing to their modified appearances, great mistakes may be made in diagnosis.

All that has been said about the influence of systemic disease on the tissues of the mouth is more generally conceded and accepted by medical practitioners than by some of the excessively enthusiastic dental men who claim to cure all forms of so-called pyorrhea or suppurative gingivitis by local treatment and local treatment alone. These men fail to realize that they are but maintaining a more hygienic and non-irritating influence on tissues which are rendered susceptible to inflammation and infection by a systemic trouble. Great good is accomplished by such treatment when a proper regard for the underlying cause is kept in mind. Woe to him, however, who attacks boldly by local treatment only a suppurative gingivitis of diabetic origin.

The reciprocal influence of abnormal conditions of the mouth and jaws on the general economy has not been accorded to date the importance that it must receive, if the health and welfare of human kind is to be consistently conserved.

Briefly stated, the bearing that the mouth has on the general organism is governed first, by the ability of the mouth to perform its normal functions and to contribute its share toward the intricate and marvelous method of providing nutriment to the animal system. A failure in any measure to live up to its contract is accompanied by disturbances further on in the process with associated efforts to counterbalance the evil. So, then, must other organs and parts suffer or assume responsibilities which will eventually tell on their longevity.

Second, the matter of provision of food to the system through the natural avenue, the mouth, should be accom-

* Read in the Section on Stomatology of the American Medical Association, at the Sixty-Third Annual Session, held at Atlantic City, June, 1912.

plished without contamination such as is prone to occur when the mouth is not kept mechanically clean, and by this is meant that all surfaces of the buccal mucous membrane and all surfaces of the teeth must be kept free from oral débris and the virile organisms that infest unclean mouths. Third, such local infections as arise in spite of a reasonable amount of care must be met and conquered.

Stress should be placed on the eradication of infective foci from the mouth, even though radical surgical procedures and the sacrifice of teeth become necessary. Current literature, both medical and dental, contains many references to the relation of remote diseases to infections arising within the mouth. Infective endocarditis, rheumatism, anemias and other affections of serious moment are occasionally laid to the door of mouth infection. Many patients in my practice within recent years have exhibited decided attacks of neuritis involving the arm, shoulder and other parts that have cleared completely following the surgical removal of an infected area from the mouth. Patients who are suffering from diabetes, kidney troubles, etc., which may have been the predisposing cause of gingival disturbances within the mouth, are usually improved when efficient treatment removes the pus which by absorption aggravates the systemic trouble.

It is unnecessary for me to dwell further on the many and varied complications that may arise from septic absorption within the mouth.

Another important field of study is that which relates to the reflex disturbances that arise as a result of dental and maxillary abnormalities. The ear, the eye, the nose and throat, as well as parts further removed from the mouth, are occasionally the seat of baffling disturbances that are traced to conditions within the mouth. Neurologists are beginning to realize that some of their cases of melancholia, dementia præcox and other types of nervous disorder are occasionally brought on by an impacted tooth, a hidden abscess, or some other equally obscure trouble connected with the mouth and teeth. I am seeing such cases with increased frequency and in most instances am able to record a decided improvement if not an absolute cure of the nervous or mental condition.

At this time I will not report the cases that have come under my care for I will hope to supplement this brief communication with one which will be more clinical in its nature.

Before closing I desire to make reference to a paper by Baker,[1] in which he presents a compilation of diseases attributable to mouth conditions. According to his list, 125 different affections were traced by scientific men to dental and mouth disorders. In studying the bibliography of Dr. Baker's article, I find that almost all authors quoted are graduates of medicine. I refer to this point as the strongest evidence toward the verification of their findings, and that such reports were not made as the result of biased observations. Though Dr. Baker collected seventy-nine articles, written within the past ten or eleven years, from which he culled the references to the large variety of diseases, such sporadic outbursts of individual enthusiasm are scarcely adequate appeals for the betterment of the cause for which we are working. The dental profession, the medical profession and the lay public have begun to realize what scientific stomatology will contribute toward health preservation.

116 West Fifty-Ninth Street.

1. Baker, Edward H.: "The Natural Field of Dentistry," Dental Cosmos, 1912, liv, 663.

ABSTRACT OF DISCUSSION

DR. JOSEPH HEAD, Philadelphia: There seems to be the general idea that it is extremely dangerous to treat diabetics who have pyorrhea. I have in my own practice at present two patients suffering from diabetes; by injection of bifluorid solutions into the pockets I have been able with care and safety to scrape the roots clean and to get a fair amount of healing. In fact, teeth which have been very loose at the start have steadily improved, and pus, which flowed from nearly all parts of the mouth, has almost entirely disappeared. The discomfort which the patients experienced before they came to me has been relieved, and although they have not been cured, they are comfortable and I feel that there is every reason to believe that as time goes on they will perhaps continue to improve. One of these two patients had a lower six-year molar that could not be cured of the pus that flowed from around the anterior root. I scraped the pocket out but that did not improve it. The pulp was apparently healthy and normal, perhaps a little oversensitive, but it was only when I destroyed the pulp in that tooth that the pus ceased to form. I have noticed frequently in pyorrhea that a pocket from which the pus could not be eradicated would not heal up until an apparently healthy pulp was destroyed. It is easy to understand that the live pulp may be so infected with the overirritated peridental membrane that it may not be able to stand against the inroads of infection that tend to prolong the flowing of the pus around the pockets.

DR. VIRGIL LOEB, St. Louis: A great fault in the study of diseases of the mouth is the omission or failure of many men to make a thorough examination of the oral cavity. Dr. Schamberg confined his remarks in this respect to medical men, but I think he should have made it broader and included the dental men as well. There are very few, I think, who take the time to make a thorough examination of the mucous membrane of the oral cavity; if this were done on every patient and only a single instance of the beginning of some malignant trouble were disclosed, it would be well worth while.

DR. M. I. SCHAMBERG, New York: I referred to men who attempt to treat cases of pyorrhea in diabetic cases without any regard to the underlying cause. I treat diabetic cases constantly and have often noticed after local treatment that there has been a diminution of glycosuria. I approach these cases a great deal more cautiously than I do the so-called simple cases. Cases have been referred to me for treatment, after men, some of them pyorrhea specialists, have injured the patients materially by disregarding their systemic trouble. I have had a number of cases in which the floor of the antrum had sloughed away as the result of pyorrheal treatment applied in diabetic cases.

TEMPORARY TOXIC AMAUROSIS AND PARALYSIS FOLLOWING INJECTION OF ETHYL ALCOHOL INTO A CHRONIC EMPYEMA SINUS

LOUIS FRIEDMAN, M.D., NEW YORK
Lecturer on Gynecology, New York Polyclinic Medical School and Hospital; Cystoscopist, Harlem Hospital

Alcohol amaurosis is usually due to chronic intoxication, following the abuse of distilled and malt liquors.

Acute alcohol amaurosis is comparatively rare, but even in these so-called acute cases, total or partial blindness has followed when whisky in excess has been drunk for several weeks. Methyl alcohol taken in toxic dose has produced blindness within twenty-four hours. De Schweinitz[1] says:

"In so far as the visual effects are concerned the acute cases may be dismissed with comparatively short notice, inasmuch as, except in rare instances, the visual phenomena are of temporary character, and amblyopia, if it occurs at all, is exceedingly uncommon. The ocular symptoms consist chiefly in paresis of one or other of the external ocular muscles. . . . Now and then acute alcoholism seems to have been

1. De Schweinitz, G. E.: Toxic Amblyopias, 1896, p. 25.

responsible for almost complete blindness without ophthalmoscopic change, rapidly disappearing under antiphlogistic treatment and total abstinence."

I have been unable to find any record of pure ethyl alcohol amaurosis. The following case therefore presents features of sufficient interest to make it worth reporting. It was a case of acute amaurosis which occurred immediately after the absorption of 90 per cent. ethyl alcohol; the mode of entrance was the injection of about 25 c.c. of pure alcohol into a chronic empyema sinus through a cannula introduced into the sinus; the amaurosis was accompanied by temporary motor paralysis of both upper and lower extremities, and was followed by complete recovery.

The patient, I. S., aged 24, single, had always been well up to June 6, 1910, when he was operated on for gangrenous appendicitis. The wound was drained. Following this the patient developed a subphrenic abscess for which he was operated on July 8. One week afterward, symptoms of thoracic empyema appeared. July 15, 1910, a thoracotomy was performed, with drainage.

The appendix and subphrenic abscess wounds healed entirely, but a chronic empyema sinus developed, which was treated up to March 25, 1911, about ten months, without any sign of healing. There evidently was a communication between the sinus and the bronchus, because the first time I injected bismuth paste, the patient nearly choked in an effort to cough up and expectorate the bismuth paste which I injected. Repeatedly on the injection of bismuth paste although in smaller quantities injected slowly, he would cough and expectorate the bismuth.

This treatment lessened the discharge considerably for a while but eventually had to be given up since no benefit resulted. After the sinus narrowed down considerably I began to inject 95 per cent. ethyl alcohol into it, using a narrow cannula, and a 30 c.c. capacity syringe. The injections were repeated at each dressing without causing any untoward symptoms whatever until March 11, 1911, when, after I had injected the sinus with the alcohol, the patient without any warning slid off my table, landing on the floor in a perfectly limp condition. He was unconscious for a few seconds. Believing that he had fainted, I allowed him to stay on the floor until he recovered consciousness, when I asked him to help himself back to the table; but he replied that he was unable to move his legs. I picked him up and placed him on the table, when he assured me that he felt all right but that he could not see me. Absolute flaccid paralysis also was present in both upper and lower extremities. His mind was clear, speech normal, skin and lips normal in color, no cyanosis; pupils were moderately dilated and reacted to light. The patient was unable to see me or any object held up to him, but was able to distinguish light from darkness: Respiration was somewhat rapid and sighing; the patient was unable to move or lift either upper or lower extremities. This condition lasted about twenty minutes.

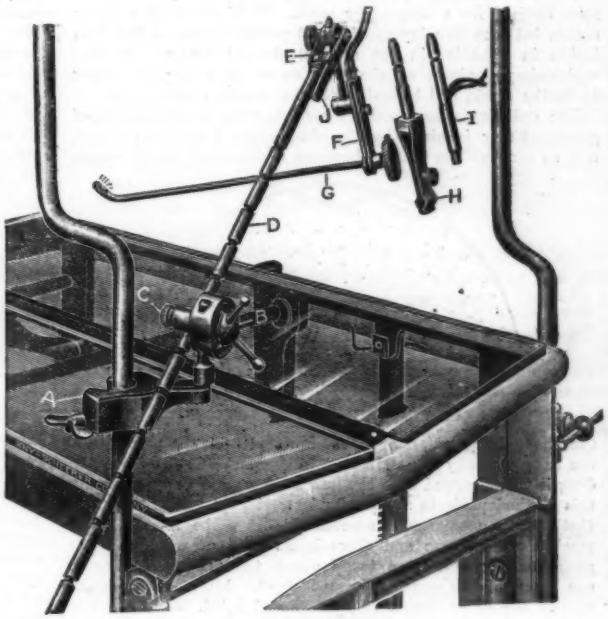
Cutaneous sensation was present. The patellar reflexes were exaggerated. Gradually the patient regained control of his extremities, first his legs, then his arms, accompanied by incoordination; that is, if I asked him to lift his leg he would do so in a jerky, uncertain, draggy fashion, then he would lose control again, the limb falling down entirely limp; or in attempting to lift his arm, he could not without simultaneously attempting to lift his leg as well. Muscle resistance was absent at the beginning but gradually returned in both upper and lower extremities. The patient stated that no matter how hard he tried he could not move or control his limbs. In about half an hour all signs of motor paralysis disappeared, and he could move and control his extremities as well as ever, walking without assistance. Complete amaurosis was present for about one hour, but gradually his sight returned so that four hours after the accident he was able to distinguish objects and shapes fairly well. Perfect vision was regained in about three days. A competent oculist examined his eyes half an hour after the accident; a slight congestion of the fundus was present. No other ophthalmoscopic change was noted. A month following I did a subperiosteal resection of portions of five ribs; the patient had a rather stormy convalescence but eventually recovered with absolute cure of his empyema sinus.

262 West One Hundred and Thirteenth Street.

CYSTOSCOPE HOLDER

HENRY DAWSON FURNISS, M.D., NEW YORK
Assistant Attending Gynecologist, New York Post-Graduate Hospital and New York Red Cross Hospital

In teaching cystoscopy in women the inability to hold steady the long male cystoscope so that demonstrations could be given the students led to the use of shorter instruments. These had some objections, among which was the fact that they are made in few of the different types; so a holder that would allow free manipulation of the cystoscope and that could be fixed in any desired position was a welcome device. I feel that the instrument here presented, which embodies many improvements suggested by use, serves all the purposes for which a holder is desired.



Cystoscope holder.

A is a removable piece designed to fit a leg-holder of any size from ¼ inch to ¾ inch. On the projection is a short rod over which slips B, this allowing easy removal of the holder proper. B is so designed that it allows an up-and-down, a circular and a twisting motion of the long rod D. All of these motions can be locked by the large wing nut on B. C is a screw that projects into the slots on the long rod D, thus preventing lengthwise motion; after adjustment of length for the particular table on which it is to be used, there is seldom any necessity for a change. The portion E is insulated from D by fiber washers, and thus short-circuiting is prevented. On the distal end of the spring J is a pin that projects into the slot cut in the piece that is directly connected to the cystoscope; this prevents slipping and allows rotary motion. These pieces are made for all cystoscopes with a rotary contact; F is for the Continental type, I for Wrapper instruments. H is a universal holder clamping around the cystoscope shaft. F and I also serve as electric connections. Examinations are made with the cystoscope attached to the holder. With most other holders, attachment is made after locating the part to be seen.

The advantages of using such an instrument are that the teacher can demonstrate to the student any part of the bladder, and also the student can leave the instrument in position to show that concerning which he wishes instruction. The instrument holds the cystoscope in any desired position for any length of time. If for any reason the examiner is interrupted and has to leave the table, it is not necessary to withdraw the cystoscope or to have some one else hold it; he has only to tighten the nut on B and the one on E. Where ureteral catheters are to be left in for any length of time, for the collecting of urine or washing out the renal pelvis, this instrument is of the greatest assistance.

For five months I have been using it not only in private, but more especially in teaching, which it has made immensely easier; I now regard it as almost indispensable.

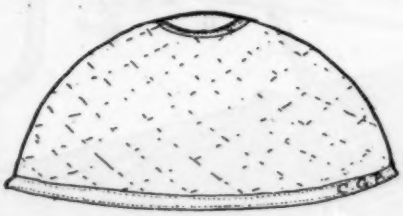
393 West End Avenue.

AN ETHER-MASK COVER

Carl G. Parsons, M.D., Denver

The accompanying illustration represents a cover which I have devised for a drop-ether mask. It is made by quilting cotton between two layers of No. 2 gauze, cutting a hole 1½ inches in diameter in the summit, taking out one or two wedge-shaped pieces at the base so as to cause the cover to fit the mask, and hemming all raw surfaces with tape.

The ordinary ether-mask is covered with a few layers of gauze. Ether is given by the drop method slowly at first, and as soon as the patient becomes accustomed to the vapor,



Ether-mask cover.

the above-described arrangement is fitted over the mask, with the base carefully approximated to the patient's face, and the drug is then dropped onto the gauze through the aperture. By this method patients are put under and kept under the anesthetic with a minimum amount of drug, the anesthesia is much more uniform and there is no need of winding roller gauze or a cumbersome towel about the mask. The cover can be applied or removed in an instant. After each administration the cover should be washed and dried.

PENETRATING ABDOMINAL WALL WOUND BY REVOLVER BULLET, COMPLICATED BY TWENTY-TWO INTESTINAL PERFORATIONS; OPERATION AND RECOVERY

A. Belcham Keyes, M.D., Chicago

Professor of Gynecology, Chicago Policlinic; Assistant Professor of Gynecology, Rush Medical College; Surgeon to Cook County Hospital

History.—C. P., an Austrian, aged 35, a machinist, was admitted to my surgical service in Cook County Hospital, April 27, 1908, with a history of having been shot about a half-hour previously. The bullet had been fired by a man somewhat taller than himself who was standing to the left and somewhat behind him. The external wound apparently had not bled; neither had there been any coughing, vomiting or passage of blood from the rectum or bladder. Comparatively little pain was complained of in the abdomen itself but there was intense pain in the perineum and in the left side of the scrotum.

Examination.—The abdomen was slightly distended and the recti and oblique muscles were rigid, especially on the left side. The absolute liver dulness was lost. A small oval dime-sized wound was found in the left midaxillary line, on a level with the umbilicus, presumably the place of entrance of the bullet. The left side of the scrotum was somewhat discolored and very tender.

Operation.—Under ether anesthesia a median incision, 10 cm. in length, extending from midway to the ensiform downward to the left of the umbilicus to a point midway between this and the pubes was made. The abdominal cavity contained a slight quantity of fluid feces with much clotted blood and probably some bile. The first part of the jejunum examined showed eleven intestinal perforations; several were also found in the mesentery. Five of the intestinal perforations were closed with fine chromicized catgut, and about 10 inches of another loop with six perforations, and a badly injured mesentery and blood-vessels were exsected and a Murphy button inserted and doubly stitched with Lembert's sutures. Eleven more perforations were later found and sutured with fine catgut by Czerny-Lembert sutures. No more perforations being discoverable, the peritoneal cavity and intestines were carefully sponged clean with moist compresses wrung out of normal salt solution; the parietal peritoneum was closed with continuous catgut sutures, the recti fascia and skin with interrupted silkworm-gut sutures and the wounds dressed. No drain was inserted. The patient showed signs of shock and anemia from loss of blood but responded to a hypodermic of strychnin sulphate, one-fifteenth grain. Four hours after the shooting, he was put to bed in fair condition with weak but regular pulse and thoracic respiration.

Some interesting injuries caused by the ball noticed during the operation and in the exsected loop are shown in the diagram.

Diagram of peculiar injuries by bullet: (1) perforation of the bowel from side to side; (2) perforation of both layers of the mesentery, cutting the blood-vessels; (3) perforation of a bowel loop at its apex; (4) perforation near apex of small loop; (5) perforation at apex in a sharply bent loop; (6) intramesenteric perforation; (7 and 8) entrance of the ball lower in a loop of bowel, intramesenteric exit and reentrance, and final exit on a free surface of bowel.

Postoperative History.—An enema of glycerin and olive oil administered on the evening of the third day was expelled with some flatus and liquid fecal matter. The abdominal silkworm gut sutures were removed on the fourteenth day, the wound having healed by primary intention. A fifteenth-day radiograph showed the Murphy button in the left inguinal region, probably in the sigmoid. A pelvic radiograph on the seventeenth day failed to show the button, but revealed a 32-caliber bullet lying superficially just over the external inguinal ring, which was removed without anesthesia. Two subsequent radiographs also failed to reveal the button which had evidently been passed unnoticed by the patient (who was now permitted to go to the closet) on about the sixteenth day. The patient was discharged (May 24, 1908) on the twenty-seventh day as cured. May, 1911, three years later, I exhibited this patient before the members of the Chicago Medical Society (North Side branch) in a condition of perfect health. He works as a machinist, can lift 150 pounds and has neither disturbance of digestion nor pain. The abdominal wound is entirely devoid of any signs of hernia.

When asked as to how long before the shooting he had had his last meal, he stated that ten minutes before the shooting he had eaten a cheese sandwich and drunk two bottles of beer.

Beyond the interest the recovery has despite the large number of intestinal perforations, there is the fact that the radiograph, showing the bullet over the external ring, might easily have been misleading, causing at least an unfortunate

delay, in the belief that the bullet had only contoured the abdominal wall.

In conclusion I wish to thank Drs. R. J. Pickard, E. B. Rogers, J. R. Kauffman and R. C. Menzies, interns, for their able assistance.

122 South Michigan Boulevard.

New and Nonofficial Remedies

THE FOLLOWING ADDITIONAL ARTICLE HAS BEEN ACCEPTED BY THE COUNCIL ON PHARMACY AND CHEMISTRY OF THE AMERICAN MEDICAL ASSOCIATION. ITS ACCEPTANCE HAS BEEN BASED LARGELY ON EVIDENCE SUPPLIED BY THE MANUFACTURER OR HIS AGENT AND IN PART ON INVESTIGATION MADE BY OR UNDER THE DIRECTION OF THE COUNCIL. CRITICISMS AND CORRECTIONS ARE ASKED FOR TO AID IN THE REVISION OF THE MATTER BEFORE PUBLICATION IN THE BOOK "NEW AND NONOFFICIAL REMEDIES."

THE COUNCIL DESIRES PHYSICIANS TO UNDERSTAND THAT THE ACCEPTANCE OF AN ARTICLE DOES NOT NECESSARILY MEAN A RECOMMENDATION, BUT THAT, SO FAR AS KNOWN, IT COMPLIES WITH THE RULES ADOPTED BY THE COUNCIL.

W. A. PUCKNER, SECRETARY.

AFRIDOL.—Afridol is sodium hydroxymercuric toluylate, $C_6H_3(CH_3)$ (COONa) HgOH, 2:3:1.

Afridol is an odorless, tasteless white powder, difficultly soluble in neutral or acid media, but soluble in ammoniacal solution containing ammonium chloride. Filtered aqueous solutions of afridol remain unchanged on the addition of ammonium sulphide solution or albumin solutions.

If afridol be boiled with hydrochloric acid, an odor of benzoic acid is produced and the cooled solution when saturated with hydrogen sulphide yields a black precipitate of mercuric sulphide.

Actions and Uses.—It is said to be of value for disinfection of the hands in surgical and obstetric work and for disinfection of various other parts of the body, as well as of instruments and other objects. It has also been recommended in the treatment of parasitic diseases of the skin and scalp, such as favus, acne, sycosis and seborrhea.

Dosage.—Marketed only as Afridol Soap (see below).

Manufactured by Farbenfabriken vorm. Friedr. Bayer, Leverkusen, Germany (Farbenfabriken of Elberfeld Co., New York). U. S. patent applied for. U. S. trademark No. 81,387.

Afridol Soap.—Afridol soap is a soap containing afridol 4 per cent.

If an aqueous solution of afridol soap be treated with either ammonium sulphide or albumin solution, no precipitate should be formed. If an aqueous solution of afridol soap be boiled with hydrochloric acid and the solution made alkaline with ammonium hydroxide, the addition of ammonium sulphide solution should yield a black precipitate of mercuric sulphide.

Actions and Uses.—(See Afridol).

Dosage.—Afridol soap is used in the same way as any other soap. For the prevention of boils the foam is generally allowed to dry or to remain on for at least ten minutes and then washed off.

Therapeutics

DISTURBANCES OF THE HEART

(Continued from page 1797)

TREATMENT OF ENDOCARDITIS

As mild endocarditis rarely occurs primarily but is almost always secondary to some acute disease, its immediate treatment is only a slight modification of that of the disease that is causing it. A complication that is so frequent should always be expected, and consequently warded off or prevented, if possible. Knowledge of the diseases that most likely cause endocarditis makes frequent heart examinations a necessity, to note when it arrives. While an extra heart tire, sleeplessness, the circulation of unnecessary toxins from a bad condition of the bowels and from improperly selected food all make this complication more likely, its occurrence is, nevertheless, often unpreventable.

The most efficacious preventive measures are sleep, rest, absence of pain, prevention of exertion, proper food that does not cause flatulence or other indigestion, good, sufficient daily movements of the bowels, the prevention of intestinal distention, and maintenance of a clean, moist surface of the body, produced by such sponging and bathing as the temperature demands.

The disease having developed, the indications for treatment are really few; in fact, the treatment is mostly negative. There is generally but little pain; the temperature from simple endocarditis alone is not high, and the acute symptoms tend to abate.

Local Treatment.—Endocarditis having been diagnosed, especially if there is palpitation or pain, the ice-bag over the heart is often of considerable value, but not so efficient as in pericarditis. It often tends to quiet the heart, and may be of some value reflexly in slowing the inflammation. If it causes restlessness, however, and does not diminish, or perhaps in some instances increases, the pain, it certainly should be stopped. Children, in whom this complication so frequently occurs, generally do not bear the ice-bag well. Sometimes it may be advisable to substitute warm applications, and often a great deal of comfort is derived from them, the patient soon going to sleep. One of the greatest values of either cold or hot applications is diminution of the discomfort from the cardiac disturbance, and the stopping of any pain that may be present. If they do not do this, there is no object in using either cold or heat.

The discomfort from blisters over the heart during the acute stage of endocarditis is greater than any good that they can do. In adults a few small blisters may be used intermittently around the borders of the heart, after the acute symptoms are over, to act reflexly on the heart and possibly aid absorption of inflammatory products. Sometimes improvement seems to follow such treatment; it certainly can do no harm.

During convalescence the skin over the heart may be painted with iodin, repeated often enough to cause stimulation without injuring the skin; it seems at times to be of value. Various iodin ointments or iodid ointments have been used, but they probably have no more value than the administration of small doses of iodid.

Systemic Treatment.—As this complication most frequently occurs during acute rheumatism, the question arises as to the value or harmfulness of salicylates and alkaline drugs. With our recent better understanding of the action of pure salicylates on the heart (either natural or synthetic salicylic acid, which have been shown to act identically, if equally pure, we must believe that in any ordinary dosage they will injure the heart but rarely. While salicylic acid will not prevent endocarditis, it should be continued, if it is benefiting the arthritis. In other words, the indication for its use depends on its effect on the joints. As it acts at times almost as a specific in rheumatism, it would seem that it should be of value in the endocarditis caused by rheumatism. On the other hand, the endocarditis occurs during the second or third week of acute rheumatism, after the blood has been thoroughly saturated with salicylic acid. Therefore it certainly does not tend to prevent rheumatic endocarditis; hence for this complication alone salicylic acid is not indicated.

Anything that tends to increase the acidity of the tissues and to diminish the alkalinity of the blood, whether from starvation or other causes, seems to produce endocardial and myocardial irritation, if not actual inflammation. Therefore in a disease like rheumatism

that seems to be made worse by anything that increases the acidity, alkalies are obviously indicated, and it is probable that an increased alkalinity of the blood tends to prevent endocardial irritation, and may soothe an inflammation already present. Until we have some positive knowledge to the contrary, alkalies should be freely administered during endocarditis, especially during rheumatic endocarditis. Potassium citrate in 2-gm. (30-grain) doses, in wintergreen water, should be given every three to six hours, depending on how readily the urine is made alkaline. This may be given with the salicylic acid treatment, and also when the salicylic acid has been stopped. It may be well, if sodium salicylate is being used, to give also sodium bicarbonate, the sodium bicarbonate often preventing an irritation of the stomach from the sodium salicylate, the dose being equal parts of the sodium salicylate and the sodium bicarbonate administered in plenty of water. If some other form of salicylic acid is preferred, novaspirin, which is methylene-citrylsalicylic acid and contains 62 per cent. of salicylic acid, is perhaps the least irritant to the stomach of the salicylic preparations. This drug is decomposed in the intestine into its component parts, salicylic acid and methylene-citric acid. If this drug is combined with sodium bicarbonate, the disintegration into its component parts would be likely to occur in the stomach.

It is essential for the welfare of the patient, especially after a long illness before the complication of endocarditis could occur, and in rheumatic fever, in which all meat and meat extractives have been kept from the diet, that small doses of iron should be administered daily. Not only the fever process, but the salicylic acid tend to prevent the healthy normal growth of red corpuscles, and such patients suffering from rheumatism are often seriously anemic after the acute inflammation has ceased. The iron administered may be 5 drops of the tincture of the chlorid, in lemonade or orangeade, twice in twenty-four hours (and it should be remembered that lemon and orange burn to alkalies in the system and do not act as acids); or 0.1 gm. (1½ grains) of reduced iron in capsule twice in twenty-four hours, or a 3-grain tablet of *Eisenzucker* (saccharated oxid of iron) twice in twenty-four hours.

As so many times repeated, real pain must be stopped, and morphin, either by the mouth or hypodermatically, should be used to the point of stopping such pain. If the patient is a young child, the sulphate of codein or the deodorized tincture of opium may be used, in the dose found sufficient, and either one will act satisfactorily. The dose given should be small and repeated sufficiently often to stop the pain. The dose necessary for the given individual will soon be learned, and that dose may be repeated at such intervals as the condition may require. Sometimes the hypnotic selected, if one is needed, will be sufficient to quiet the cardiac aches or pains.

If there is much restlessness and the circulation is good, that is, if myocarditis is probably not present, the bromids may be of great value, especially in children. The dose should be sufficient to quiet the nervous system. The drug may be discontinued after a few days, if the conditions improve. If the bromid, except in large doses, will not cause sleep, a sufficient dose of chloral should be given. Chloral is one of the most satisfactorily acting drugs to produce sleep and to cause cardiac rest that we have. While it should not be given if there is real cardiac weakness, the good that it does is so much greater than the possible bad effect on the heart, that it should not be forgotten for some newer hypnotic. The worst part of this drug is its taste, and the best way to administer it is to have it in solution in water and the dose given on cracked ice with a little lemon juice, to be followed by a good drink of water and a piece of orange pulp for the patient to chew. Ordinarily a bad-tasting drug such as chloral is well administered in effervescing water, but effervescing waters are generally inadvisable when there is any kind of inflammation of the heart, as they are likely to cause distention of the stomach and pressure on the heart. Some physicians prefer chloralamid as a less disagreeable drug and one that acts almost as efficiently as chloral. As the dose of this must be larger than the dose of chloral, it is a question of doubt as to which is the better drug to use. Of the newer hypnotics, veronal-sodium (sodium-diethyl-barbiturate) is among the best. It acts quickly, is less depressant and is a safer salt than most of the other newer hypnotics. It is the readily soluble sodium salt of veronal (diethyl-barbituric acid). When combined with any active drug, sodium seems to make it less toxic and less depressant. The dose of this drug is 0.2 to 0.3 gm. (3 to 5 grains).

If the patient is weak, the circulation depressed, the blood-pressure low, and the heart rapid, the drug advisable to produce rest and sleep is almost always morphin or some other form of opium. Morphin, with few exceptions, is a cardiac tonic and a cardiac stimulant, unless the dose is much too large. As long as the bowels are daily moved and the food is not given at the time of the full action of the morphin, when digestion might be delayed or interfered with, in most patients the action of this drug during serious illness is entirely for good. The greatest mistake in using morphin for the production of sleep, or for physical and mental rest and comfort when there is not severe pain, is in giving too large a dose. If pain is not severe, or is due to inflammatory distention of some undilatable part, to pressure on some nerve, to distention of some tube by a calculus or to some serious injury to the nerves, large doses of morphin are not needed. Small doses will act much more efficiently. It is excessively rare that a hypodermic of one-fourth grain of morphin sulphate is needed, except for the conditions enumerated. It is often a fact that so small a dose as one-eighth grain of morphin or even one-sixth grain will cause sufficient stimulation of a nervous patient, because its primary stimulant effect on the spinal cord is greater than its depressant effect on the brain, to require another dose (one-fourth grain altogether) to give such a patient rest. On the other hand, this patient may many times be quieted by one-tenth grain of morphin sulphate on account of the size of the dose being not sufficient to stimulate the spinal cord. Many a time clinically when one-eighth grain has failed, a dose of one-fourth grain having been apparently necessary, a change to one-tenth grain has proved entirely and perfectly satisfactory, much to the surprise of the attending physicians.

As intimated above in the paragraph on "prevention," the diet during endocarditis must be carefully regulated. It must be sufficient, it must be appropriate for the disease in which the complication occurs, but it must be in such dosage and must be administered with such frequency as to cause the least possible indigestion. Large amounts of milk are rarely advisable. Too much milk is certainly given, even in rheumatism. While pretty well tolerated by children, it is often badly tolerated, as far as digestive symptoms are concerned, by adults. The amount of liquid given should be governed by the amount of urine passed and by the amount

of perspiration. The patient should not be overloaded with liquid if he does not need it.

If the bowels are known to be in excellent condition and not loaded with fecal matters, brisk catharsis is not needed simply because endocarditis has developed. If the bowels have been neglected, a small dose of calomel, aided by a compound aloin tablet, is necessary and good treatment. Subsequent movements of the bowels should be daily obtained by vegetable laxatives with occasional enemas, as needed. With an inflammation of the heart and the possibility of myocarditis developing or being actually present, it is not advisable to use salines freely or often.

Whether any drug should be used which acts directly on the heart is often a question for decision. As endocarditis is generally secondary to some acute disease, the patient has become weakened already and the circulation is not sturdy; therefore such a drug as aconite is probably never indicated. The necessary diminished diet, catharsis, hypnotic, salicylic acid and alkalies all tend to quiet the circulation and diminish any strenuosity of the heart that may be present. Unfortunately, during fever processes digitalis in ordinary doses rarely slows the heart; and while it might slow the heart if given in large doses, it would also cause too powerful contractions of the ventricles. Digitalis is inadvisable if there is much endocardial inflammation, and especially if there is supposed or presumed to be myocardial inflammation. If a patient had already valvular disease from a previous endocarditis, and during this attack insufficiency of the heart was evidenced by pendent edemas, digitalis should be administered; but it probably should not be given to other patients during the acute period of inflammation.

During rheumatism the peripheral blood-vessels are generally dilated and the skin perspires profusely. This is caused not only by the rheumatism, but also by the salicylates. The surface of the body should be sponged with cold, lukewarm or hot water, depending on the temperature, especially of the skin. The cold water will reduce the temperature and tone the peripheral blood-vessels; the hot water, if the temperature is low and the skin moist and flabby, will cleanse it and also tone the peripheral blood-vessels. If the blood-vessels are dilated and the perspiration profuse, atropin is indicated, both as a cardiac stimulant and contractor of the blood-vessels and as a preventer of too profuse sweating. The dose should be from 1/200 to 1/100 grain for an adult, given two or three times in twenty-four hours, depending on its action and the indications. It should be remembered that atropin is not a sleep-producer; it may stimulate the cerebrum. Therefore at night it might well be combined with a possible necessary hypodermatic injection of morphin.

The question of the advisability of strychnin is a constant subject for discussion. Strychnin is overused in most patients who are seriously ill. In a patient in whom we are trying to cause nervous and muscular rest strychnin is certainly contra-indicated. On the other hand, if the heart is acting sluggishly, the peripheral circulation is imperfect, and atropin is not acting well, it is advisable to give strychnin in a dose not too large and not too frequently repeated. Strychnin should be avoided, if possible, in the evening so that the patient may sleep. Whether it should be given by the mouth or hypodermatically would depend entirely on the seriousness of the condition. Once in six hours is generally often enough for strychnin to be administered unless the dose is very small.

It is rarely, if ever, advisable to use alcohol. In certain instances, however, especially in older patients who are accustomed to alcohol, a little whisky administered several times a day may act only for good, both as a food and as a peripheral dilator. But it must be remembered that alcohol is not a cardiac stimulant, and that a large dose will be followed by more cardiac depression. Nitroglycerin may act as well as whisky in the kind of cases mentioned. Caffein stimulation in any form is generally inadvisable during inflammation of the heart.

The duration of acute endocarditis varies greatly; it may be two or three weeks, or the inflammation may become subacute and last for several months. Although mild endocarditis rarely causes death of itself, it may develop into an ulcerative endocarditis, and of course then be serious *per se*. On the other hand, it may add its last quota of disability to a patient already seriously ill and death may occur from the combination of disturbances.

As soon as all acute symptoms have ceased, rheumatic or otherwise, and the temperature is normal, the amount of food should be increased; the strongly acting drugs should be stopped; especially the alkalies should not be given too long, and the salicylates should only be given intermittently, if at all; iron should be continued, massage should be started, and iodid should be administered, best in the form of the sodium iodid, 0.1 to 0.2 gm. (1½ to 3 grains), twice in twenty-four hours, with the belief that it does some good toward promoting the resorption of the endocardial inflammatory products and can never do any harm. Prolonged bed rest must be continued, visitors must still be proscribed, long conversations must not be allowed, and the return to active mental and physical life must be most deliberate.

No clinician could state the extent to which the valvular inflammation will improve or how much disability of the valves must be permanent. It is even stated by some clinicians that a rest in bed for three months is advisable. While this is of course excessive, certainly when the future health and ability of the patient are under consideration, and especially when the patient is a child or an adolescent, time is no object compared with the future welfare of the individual's heart. It is one of the greatest pleasures of the clinician to note such a previously inflamed heart gradually diminish in size and the murmurs at the valves affected gradually disappear. Although they may have disappeared while the patient is in bed, he is not safe from the occurrence of a valvular lesion for several months after he is up and about.

While the discussion of hygiene would naturally be confined to the hygiene of the disease of which the endocarditis is a complication, still the hygiene of its most frequent cause, rheumatism, should be referred to. Fresh air and plenty of it, and dry air if possible, is what is needed in rheumatism, and a shut-up, overheated and especially a damp room will continue rheumatism indefinitely. It is almost as serious for rheumatism as it is for pneumonia. Sunlight and the action of the sun's rays in a rheumatic patient's bedroom are essential, if possibly obtainable.

As so many rheumatic germs are absorbed from diseased or inflamed tonsils or from other parts of the mouth and throat, proper gargling or swashing of the mouth and throat should be continued as much as possible, even during an endocarditis.

(To be continued)

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[*For other information see second page following reading matter*]

SATURDAY, NOVEMBER 23, 1912

SOCIALIZING THE BRITISH MEDICAL PROFESSION

As our readers are aware, if they have followed our London letter from week to week, a bitter conflict has been going on in Great Britain over the terms of the so-called Insurance Act. It is a peculiar fact that although this law is probably the most revolutionary, so far as medical practice is concerned, of any measure yet introduced in any English-speaking country, the controversy between the government and the physicians has been almost entirely over the question of compensation, and not over the principles on which the law is based. And yet, if we are not mistaken, this law marks the beginning of the end of the old system of the individual practice of medicine and of the old relationship between patient and physician — the beginning of a new era, both for society and for physicians. It provides for nothing less than an assumption, on the part of the government, of the responsibility of providing proper medical care for citizens who are financially unable to secure it for themselves. Under the terms of the act, all persons whose total annual income is less than $800 (£160) will be entitled to medical services furnished by the government and paid from a fund made up jointly by workmen, employers and the government. Persons having an income above $800 will continue to provide their own medical services as heretofore — for the present. It is estimated that approximately 15,000,000 of the inhabitants of the United Kingdom are by the terms of this act taken out of the field of private practice.

The effect of such a law can be nothing less than revolutionary, as far as the economic conditions of the medical profession are concerned. That the discussion has centered almost entirely around the question of compensation shows that physicians have no objection to being made state health officers or to having the present system of private practice largely reduced, if not abolished, so long as they are adequately compensated for their work. Another significant fact, showing both the disregard of the medical profession by the average politician and the evident lack of understanding between the medical profession and the public, is that, in drafting his bill, the Chancellor of the Exchequer made little if any effort to find out what provisions would be satisfactory to physicians themselves although the burden of the new system would fall entirely on the physicians. The British Parliament passed the bill at the personal insistence of Mr. Lloyd George, in spite of the opposition of the British Medical Association, which protested, among other things, that the compensation contemplated was inadequate. Following the passage of the bill, the majority of the profession in Great Britain refused to work under the law in its present form, and have demanded an increased compensation, as well as the modification of some other features.

The question of a fair and adequate compensation for physicians is, of course, vital. It is, however, largely a local question, since a standard of compensation which might be perfectly suitable to one country, or to one locality, would not necessarily be fair to another. Physicians in the United States will, therefore, be more interested in the general plan of the measure. The amount of compensation and the fixing of a maximum income for those coming within the provisions of the law are incidental questions. The important feature is the recognition of the fact that it is the duty of society, as represented by the government, to furnish medical treatment for those who are unable to secure it for themselves. It also means the recognition of the modern physician as a health officer of the state, working for the general good, rather than as a private, professional or business man.

There is room for much speculation as to the ultimate results. For one thing, it practically eliminates the necessity for medical charity and so stops the enormous drain on physicians which has resulted therefrom. If it is true, as was reported several years ago by a committee of one of our large local organizations, that 25 per cent. of the professional work done by physicians is entirely gratuitous, the abolition of this enormous nonproductive class of work would be beneficial. Another important consideration is that the adoption of such a plan would do away with any possible mercenary motive which might be alleged against the individual physician or the medical profession as a whole, as a reason for any indifference or apathy toward the development of preventive medicine. A third and by no means less important result, will be that those persons who, under the present private practice system, are the least able to consult physicians frequently, and who are yet most exposed to and susceptible to preventable diseases, can secure the advice and services of medical men before rather than after the disease has developed. That some form of periodic, systematic medical inspection will develop out of the state system of medicine thus created in the United Kingdom seems probable.

Last is the effect which such a measure will have on medical education and the personnel of the profession. If the state assumes the responsibility of providing medical services for any large proportion of its citizens, it must necessarily pay strict attention to the quality of

service which it provides, as a physician working under the Insurance Act will be necessarily a representative of the state. This will make it necessary for the government not only to exercise more rigid supervision over medical colleges and the character of medical instruction, but also to adopt some system which will prevent those already qualified to practice from becoming inefficient through laziness or indifference. This necessity has already been recognized in several branches of our own government. For instance, in our Army and Navy, all officers not only are required to pass rigid examinations at the time of their appointment, but are also required to pass examinations at stated intervals, for service and promotion, on pain of compulsory resignation from the service if they fail to qualify. Such a plan compels these officers to keep up with progress in the practical and technical work of their profession.

Physicians in the United States will be interested in the development of this plan in Great Britain principally on account of the light it will throw on such a plan in this country, for the possibility that the adoption of some arrangement of this sort will sooner or later be considered on this side of the Atlantic may be acknowledged. The prevention of disease is becoming more and more recognized as a social and not a professional duty. Most preventable diseases to-day are due to sins of the community rather than to sins of the individual. The state in the future must protect the citizen against disease just as it now protects him from foreign invasion. In fact, the majority of our most dreaded diseases are foreign invaders, as far as civilized nations are concerned.

The lesson which American physicians can learn from the experience of their British brethren is the importance of educating the public on health matters, and of a close understanding and sympathy between the public and physicians. If the relations between the British medical profession and the British public had been as intimate as those which fortunately are now coming into existence between physicians and the people in this country, it would have been impossible for the government to introduce or champion a bill placing such a burden on the medical profession without providing compensation which was fair and adequate. Physicians in all lands and in all times have been generous beyond all other classes in charitable deeds. Yet the physician to-day, as never before, must live comfortably and must have money to pay for instruments, books, journals and graduate instruction, if he is to be able to give his patients such services as they need and as the times demand. The physician of the future, as the official guardian of the public health, must be assured a compensation which will enable him to do his work so that the lives of the people may be protected. If the people understand the importance and value of proper medical services, there will be no difficulty about securing fair compensation.

THE PANCREAS AND DIABETES IN THE LIGHT OF NEW EXPERIMENTS

Despite the numerous attempts which have been made from time to time to unravel the secret of the mechanism of diabetes, and despite the failure of any of the proposed theories to afford a convincing solution of the difficulty, the problem retains a perennial interest. For the clinician there is involved the possibility of discovering a therapeutic procedure which would be of the utmost importance for the welfare or rescue of an increasing number of patients; while the physiologist confidently expects to find, in the unraveling of the etiology of diabetes, clear indications of the way in which the foodstuffs and notably the carbohydrates are converted into their normal end-products in the organism.

In a previous editorial,[1] reference was made to the possible relation of the liver to certain types of glycosuria. The undoubted involvement of the pancreas in relation to some forms of diabetes, at least, may be assumed to be familiar. The classic studies on the removal and the transplantation of that organ make it more than probable that the action of the pancreas is exerted through the circulation rather than by intermediation of the nervous system. Presumably there is a chemical factor concerned. The most simple and direct hypothesis assumes that there is produced in the gland some substance — or a hormone, in terms of the recent physiology — which is necessary for the assimilation or utilization of sugar by the tissues. Although the inability to use or oxidize carbohydrate is the conspicuous feature of the diabetes, it is further noteworthy that the utilization of other food derivatives may also be greatly impaired. Amino-acids are said to be excreted in some cases; and the final fatal outcome is commonly characterized by an accumulation of oxybutyric acid and its companions — products associated with the defective catabolism of fats.

There are, however, other plausible hypotheses regarding the pathologic defect underlying the diabetic insufficiency. It has been asserted that the primary difficulty is an increased formation and distribution of sugar in the liver, this organ having become freed from an inhibitory influence previously exerted on it by an assumed internal secretion of the pancreas. Here it is overproduction or failure to conserve carbohydrate properly, rather than inability of the tissues of the body to utilize sugar, which is made to account for the phenomena. Again, it has been suggested that the pancreas ordinarily furnishes some antidiabetic product, acting like an antitoxin to prevent the accumulation in the organism of products which would otherwise injure the sugar-assimilating functions of the cells. The theory of the antitoxic action of internal secretion has been a favorite one in certain quarters and has often been called on to explain the function of the ductless glands. In addition to all these is the vaguer suggestion

1. Drugs, Diabetes and the Liver, THE JOURNAL A. M. A., Oct 19, 1912, p. 1460.

that the action of the pancreas is not a direct one, but involves the interaction of other organs, such as the thyroid and suprarenal glands.

There is every reason to believe that the muscles are *par excellence* the tissues in which the ultimate consumption of sugar in the body takes place. The conspicuous energy-changes leading to mechanical work occur in the muscles; and because of their predominant bulk and physiologic activity they stand foremost as the organs of metabolism. Much would be gained, therefore, if it could be demonstrated that there is a difference between the muscles of the normal and of the diabetic individual in respect to the capacity to consume sugar. Knowlton and Starling[2] have devised a method for maintaining the heart and lungs of a mammal for many hours in a state approximating normal, while these organs are artificially fed with blood. This has made it possible to compare the performance of heart muscle from various subjects in relation to the character of the blood supplied and the inherent properties of the tissues themselves. Diabetes was produced in animals by removal of the pancreas, and the hearts of such individuals were employed for comparison with the hearts of healthy subjects. The heart muscle of dogs, fed with normal blood, consumes about 4 mg. of glucose per gram of heart per hour. This power of consuming sugar is reduced to a minimum or disappears altogether in hearts taken from animals which have undergone complete excision of the pancreas. The addition of a boiled extract of the pancreas to the blood circulating through the heart of a diabetic animal restores to the latter the power of utilizing the glucose of the circulating blood. From such facts the impression is gained that the pancreas normally produces a substance which is continually discharged into the circulating blood — a pancreatic hormone — the presence of which is a necessary condition for the assimilation of circulating glucose. Removal of the pancreas brings about the disappearance of the substance from the blood and therefore deprives the tissues of the possibility of utilizing carbohydrates as sources of energy. Knowlton and Starling frankly admit that other explanations are not absolutely excluded, however plausible the above deduction may appear. The well-known earlier contributions of Professor Starling's laboratory, which have led to the newer conception of hormones in general, inspire confidence in the tentative hypothesis suggested by the perfusion of the isolated heart and assure it a respectful hearing.

2. Knowlton, F. P., and Starling, E. H.: Experiments on the Consumption of Sugar in the Normal and Diabetic Hear., Jour. Physiol., 1912, xlv, 146. The method is more fully detailed in the Journal of Physiology, 1912, xliv, 206.

THE RESUSCITATION OF THE HEART

More than a quarter of a century ago the physiologist Schiff demonstrated on animals the possibility of resuscitating the apparently dead by means of massage of the heart. Enough experience has been gathered in the meantime to encourage the continuance of this method in appropriate cases. Our knowledge of the working of the heart — its innervation, the coordination of its parts, the intrinsic and extrinsic factors on which a normal cardiac functioning depends — have been so widely extended in the past few years that there is hope of the continued fruitful application of these newer acquirements in the domain of medical practice.

Even under what appear to be most favorable conditions, massage often fails to make the heart beat. Irritability and the power of contraction may be maintained in the organ; but the inner stimulus may be lacking and spontaneous rhythmicity fail to develop. Professor Joseph Erlanger of the Washington University Medical School in St. Louis, to whom science owes numerous valuable contributions in the domain of cardiac physiology, has offered some promising suggestions bearing on the resuscitation of the heart.[1] Contraction of the ventricles can frequently be induced by the more familiar methods. Direct electric stimulation of the ventricles is fraught with considerable danger, since it is extremely liable to set up fibrillation. In attempting to initiate the rhythm of the heart in some other way, Erlanger has proposed to supply, if possible, the impulses along the usual path by which the auricles are normally started beating. The function of the sinus region as a cardiac pace-maker is now well known. Experiments on isolated heart preparations have shown that whereas stimulation of other parts of the auricle rarely if ever results in the development of a series of beats, short periods of tetanic stimulation of the sinus region materially increase the carrying power, into the less rhythmic regions of the auricle, of the impulses originating in the sinus. In this way previously quiescent outlying regions may begin to respond to sinus impulses, or a feebly beating outlying region may begin to beat more strongly.

Since it has been demonstrated on the freely exposed heart that stimulation of the sinus region is a valuable adjunct to massage in the resuscitation of the heart, Erlanger succeeded in applying this principle without formidable surgical procedure such as the extensive opening of the chest requires. A sound carrying a stimulating electrode can be inserted through a small costal interspace opening so that its point will reach the sinus region of the heart exactly, without encountering any resistance whatever. Unipolar stimulation of the sinus can then be employed as an adjuvant to subphrenic cardiac massage. The method has been successfully applied to animals apparently dead from the effects of chloroform in the usual way. Artificial respiration by the insufflation method of Meltzer and Auer is quickly started, the stimulating sound inserted, and the massage given through an incision in the abdomen. The value of the procedure as an accessory in permanent resuscitation has been demonstrated in enough trials on dogs to

1. Erlanger, J.: Sinus Stimulation as a Factor in the Resuscitation of the Heart, Jour. Exper. Med., 1912, xvi, 452.

indicate its feasibility in man. The accidents due to experimental manipulation were few, though there are obvious sources of danger, such as puncture of the heart or lungs; but the respiratory center may fail to recover even when the cardiac performance becomes satisfactory.

The results thus achieved experimentally will doubtless encourage others to apply this method of resuscitation to man when a favorable opportunity arises. The occasional death from an overdose of chloroform on the operating-table furnishes an illustration of the possibilities always liable to arise. Animal experimentation in the hands of competent workers has contributed another example of its beneficent aims and its potent helpfulness.

THE ENTRANCE AND EXIT OF SUBSTANCES INSOLUBLE IN WATER IN THE ORGANISM

The mode in which the organism eliminates water-soluble substances that are not burned up in the nutritive processes is familiar. They leave the body through the kidneys and are discharged in the urine, unless perchance the path of excretion is into the intestine, when they pass out with the feces. In the latter way iron, calcium and magnesium, for instance, may become eliminated. Familiar drugs and poisons likewise take one of these channels, the kidneys acting *par excellence* as the excretory organs. Only in the case of volatile substances are the lungs called into play for this function.

It happens occasionally that compounds which have only a sparing solubility in water reach the circulation. How they penetrate the alimentary wall has been somewhat of a puzzle. A few years ago, when it was still supposed that fats were absorbed as such in emulsion, and that they traversed the intestinal mucosa in the form of minute globules which reappeared in the lymph-stream of the lacteals beyond the absorbing membrane, it was not difficult to explain the similar translocation of other particles which are insoluble in the intestinal contents. To-day, however, it is almost universally taught that fats are not only emulsified, but actually hydrolyzed in the digestive processes; so that it is not neutral fats, but rather the products of the lipolytic change—glycerol, soaps and fatty acids—which find their way into the absorbing mucosa. Digestion, that is, hydrolytic cleavage, is accordingly just as fundamental a prerequisite for the utilization of fat as it is for the absorption and assimilation of the other groups of nutrients. In line with this is the evidence that unsaponifiable — that is, indigestible — substances like mineral oils or petrolatum fail to enter the circulation and that they pass through the alimentary tract unchanged, as a rule at any rate. This fact forms the basis for the use of petrolatum by some clinicians in the relief of constipation. The soft, unabsorbable residue furnishes a suitable texture to the alimentary contents and a bulk which is conducive to spontaneous evacuations. Conversely the emulsified fat, once it has reached the blood, rarely finds its way out through the walls of the kidney tubules except in most unusual circumstances leading to lipuria. The secretory and absorption membranes are as a rule impervious to suspensions such as the fat globules represent.

There are substances which lack the property of solubility in water but are soluble in fats and oils. The chlorophyl of the green vegetables and the coloring-matter of butter and egg-yolk are familiar illustrations; while a number of common drugs might be cited as additional examples. Do they ever leave the lumen of the bowel in their transit along the digestive tube, or are they always lost with the feces? Recent investigations on the behavior of fat-soluble dyes are likely to throw a new light on this question.[1] Scarlet-red, which has lately received notice as a therapeutic agent, Sudan III, indophenol and annatto are types of these stains which are insoluble in water, soluble in fats and comparatively harmless. Some of the dyes of this class have long been in use for coloring certain food materials artificially. When they are introduced into the organism by various paths they are deposited in the adipose tissue and bone-marrow, which is rich in fatty materials. In investigating the mode of entry and exit of these substances, Mendel and Daniels have found that all are strikingly soluble in bile or solutions of the bile salts. When they reach the intestine, therefore, they can enter the portal circulation dissolved in reabsorbed bile or can find their way into the organism in company with the fat or its derivative fatty acid. They do not pass beyond the liver in the one case, or the lacteals in the other, unless fat is present to transport them; for they cannot travel in solution in the fat-free blood-plasma. These dyes follow the fat to the liver under conditions in which such migration takes place either from the fat depots or the circulation itself. In the hepatic cells, however, the dye is separated from the fat and secreted along with the bile into the intestine. From here it may be reabsorbed as before and a cycle of travel established, until after gradual losses the last of the pigmentary substance escapes with biliary residues in the stools.

The significance of these findings is more far-reaching than a hasty consideration may disclose. They show the bile in the important rôle of a solvent for substances which are insoluble in ordinary watery vehicles or even in blood; and by virtue of this property such compounds may be carried both into and out of the circulation. If they find a suitable carrier, like fat, they continue to travel in the body along with this constituent; but in its absence they are forced to make their exit again along with newly secreted bile. The phenomenon is one which doubtless applies to all compounds not transformed in the body, which are more soluble in bile than in water or serum. It is well known that the bile furnishes the normal channel of elimination of numerous substances,[2]

1. Mendel, Lafayette B., and Daniels, Amy L.: The Behavior of Fat-Soluble Dyes and Stained Fat in the Animal Organism, Jour. Biol. Chem., 1912, xiii, 71.

2. Compare, for example, Abel and Rountree, Jour. Pharmacol. and Exper. Therapeutics, 1909, i, 231

and it is reasonable to assume that such substances belong to the solubility category just outlined. One may stop to speculate on the possible therapeutic properties of a compound which can thus be made to traverse the paths of the biliary secretion which are occasionally the routes of bacterial invasion.

When the fat-soluble dyes (and presumably this is true for comparable drugs) are transported in the organism with an abundance of food-fat they may find their way into the mammary secretion, according to the observations of Mendel and Daniels. One can thus understand how the color of the milk-fat may be influenced by the content of lipochromes in the food; and the facts of daily experience receive a logical explanation. The Yale investigators have never found dye in the fetus or newly born young when the mothers were fed on stained food. The failure to traverse the placenta emphasizes anew the barrier which this membrane offers to the passage of substances through it and recalls the much-debated question of the real origin of fetal fat.

THE CLINICAL MANIFESTATIONS OF EPIDEMIC SORE THROAT

There is a pronounced resemblance in the symptoms and clinical course of the various milk epidemics of sore throat to which attention has been directed of late. This is shown clearly in the reports of the Christiania, Boston and Chicago[1] outbreaks. In all three the disease is described as beginning suddenly, with or without chill, followed by fever, muscular pain, headache, sometimes nausea and vomiting, prostration, and the usual local symptoms of a more or less severe follicular and membranous tonsillitis and pharyngitis. In the Chicago epidemic the pulse seemed relatively slow, and Brooks[2] also notes that in the outbreak described by him the pulse-rate was not increased in proportion to the fever. Naturally diphtheria was first suspected and in Christiania the notice of the health department was aroused by the large number of throat cultures sent in by physicians and found to consist of streptococci only. Usually the lymph-nodes in the neck became enlarged, sometimes very much so, but in some cases they were tender without marked swelling. A moderate leukocytosis has been noted.

In most cases of the recent epidemics the attack would subside rather abruptly after a few days, the patient remaining prostrated, however, and regaining strength only slowly; but not infrequently a second attack with even severer symptoms than the first would set in after a week or so of improvement. This tendency to relapse has been noted in the earlier epidemics also.

The great danger in epidemic sore throat lies in extension and generalization of the infection, and it is this tendency which stamps the disease as peculiar and as due to a virus of special virulence. In the recent epidemics, besides abscesses in the neck, often deep-seated, there were encountered otitis, glossitis and other local complications, erysipelas, purpuric and scarlatiniform eruptions, acute articular rheumatism or conditions indistinguishable therefrom with or without endocarditis, and also suppurative arthritis, pneumonia, peritonitis and other septicopyemic manifestations. Instances of phlegmonous angina have been described. Davis[3] observed that when there was pronounced glandular involvement of the neck, cultures of the blood were usually sterile; while in many cases with no special enlargement of the glands, streptococci would be obtained, and in such cases visceral lesions were common. In the Boston epidemic[4] the gravity of the complications seemed most serious in persons between the ages of 40 and 60. "Cambridge is like a city of the plague. Whomever one meets the talk is all of who is ill, who has had a relapse, who has died." In children there seemed to be a degree of relative immunity, and when the infection took hold in children the symptoms were gastro-intestinal in nature (Darling).

Statistics giving the relations of the various outstanding manifestations of general infection to the different age periods are not available, nor is anything reliable known in regard to the death-rate. That it may be high, higher perhaps than at first expected, would seem to be indicated by the observations of Capps and Miller on a group of 173 cases in which nineteen deaths occurred; it is probable, however, that these were all exceptionally severe cases. It is of interest that of the nineteen that died nine had peritonitis; in other epidemics also peritonitis is mentioned as present in about half of the fatal cases.

Preble,[5] in commenting on the peculiarities of the clinical picture of the Chicago cases, states that a temperature of 102 might be associated with a pulse of 40, and one of 104 or 105 with a pulse between 80 and 90. He noted also that even in prolonged cases, extending over months, there would be little anemia, and that jaundice was rare, all of which leads him to suggest that possibly it concerned infection of some other type than with the ordinary streptococcus.

In order to secure a more accurate knowledge of the nature of the disease in question, there is need now of careful and systematic study on a comprehensive scale of many individual cases during their entire course. Unquestionably a great deal of interest and practical value would be brought to light if studies of this kind could be undertaken from the very onset of epidemics, and for this reason as well as in the interest of prompt prevention of further spread, special efforts should be made to recognize outbreaks in the earliest stages. Only in this way can we learn whether we are dealing with

1. Capps, Joseph A., and Miller, Joseph L.: The Chicago Epidemic of Streptococcus Sore Throat and Its Relation to the Milk-Supply, THE JOURNAL A. M. A., June 15, 1912, p. 1848.
2. Brooks: Lancet, London, 1910, ii, 1391.
3. Davis, David J.: Bacteriologic Study of Streptococci in Milk in Relation to Epidemic Sore Throat, THE JOURNAL A. M. A., June 15, 1912, p. 1852.
4. Winslow: Jour. Infect. Dis., 1912, x, 73.
5. Sore Throat and Milk-Supply, abstract of discussion, THE JOURNAL A. M. A., June 22, 1912, p. 1933.

more than one disease, whether milk may convey still unknown diseases which like scarlet fever and small-pox open the door to streptococci, or that it concerns, as is now taken for granted, only the varying manifestations of primary streptococcus infection.

"FROM THE EAST, LIGHT"—AND DISEASE AND DEATH

Ex oriente lux has long been an adage emphasized by those whose education or habits of thought were more or less derived from Eastern sources. That the sun's lighting comes from the East is an accident of the earth's direction of rotation; and that from the Orient first came the semicivilized races to start a better civilization in the Occidental world is also due to another "accident"— that of climate, which allowed man to rise out of savagery. The half-way house, as it were, of the migrating Oriental was the Mediterranean semicivilization, which bore within its blood the germs of its own death, and which was illustrated in the fall of the Roman Empire.

The heart of orientalism is belief in the supremacy of fate, which cannot be withstood or surmounted. This implies slavery to disease and death. The Oriental supinely accepts disease, even when plainly due to his own sin or recklessness or when easily obviable or curable, as the unalterable law of fate, either as punishment for spiritual sin or as the vindictiveness and tyranny of his irresponsible and unseen rulers. A contradictory attitude characterizes the Occidental point of view. Disease and premature death are not the result of fate, but may be precented or cured. The history of medicine and of diseases everywhere demonstrates this truth. The best illustration is the marvelous statistical record of suddenly occidentalized Japan in her late war as regards the death-rate of her soldiers.

Compare that with the reports which come as we write of the Turkish conditions in Constantinople. This city of over a million inhabitants, in constant touch with our Western civilization, is sewerless and so insanitary that the banished "street scavengers," the dogs, would have partly prevented the present unspeakable accumulations of filth "even in the most important thoroughfares." Cholera, Asiatic cholera, small-pox and typhus are reported to be raging, and Occidental Europe, despite all its hygiene and medicine, may soon be overswept by these dread diseases.

The lesson to be learned, treasured and put into action, is that for self-protection, if not for a better motive, scientific medicine should be organized and should extend its power — its gospel — to these laggards in civilization in Oriental countries. Hygiene and preventive medicine are their greatest need, to give it to them our greatest privilege and duty. The medical missionaries have done much to break the news to the Oriental, but they have had so little power and their number has been so few that their work has been largely individual and curative rather than social and hygienic. Here is a sadly neglected opportunity for the thousands of philanthropic capitalists of our Occidental nations to lift the Oriental world out of its disease-scourged and death-bitten fatalism. We in the West have the right to demand in self-defense, if for no other reason, that the greatest evils of life shall not be loaded on us by the inefficiency and laziness of a nerveless fatalism. The medical profession is prepared and able to second such a hygienic crusade.

Current Comment

SUGGESTION AND SUICIDE

That the suggestive effect of reading details of suicides is a powerful factor in the causation of suicide among susceptible persons is recognized. The suggestion is more likely to have influence when in the account of the suicide some poisonous article commonly found in households, such as phenol, Lysol and Rough on Rats, is named as the agent employed by the suicide. In New South Wales newspapers have been asked by the pharmaceutical board not to publish the names of poisons used by suicides. In several instances leading newspapers have heeded this request, particularly in connection with Lysol poisoning cases, which are numerous in all the states of the commonwealth.[1] The House of Delegates of the American Medical Association, in 1910, adopted resolutions[2] to the effect that the publication of details of suicides in newspapers is one of the potent causes of other suicides through suggestion, and it was recommended to the public press that the details of suicides be omitted from publication. In an editorial[3] referring to this action of the House of Delegates, we made certain recommendations, by which the influence of the publication of details of crime might be tested. While it is the consensus of opinion that the publication of details of suicides does promote further similar acts, the newspapers assert that it is their duty to publish the news. In adopting this attitude the newspapers are assuming a serious responsibility, and some authoritative restriction of such publication would seem to be desirable. A definite and strong expression of public opinion against this practice would no doubt have a better effect even than legal enactments.

THE DEATH OF THE HEART

Many a physician will recall the lesson in elementary physiology which introduced him to what Huxley fancifully called the "tripod of life": the brain, lungs and heart. The heart is the last leg on which life ultimately stands, and it becomes a matter of no little interest to know how the most vital of organs enters the state known as death. What is the last part to die? The stimulus of the heart-beat apparently originates in the region at the junction of the superior vena cava with the right

1. Pharm. Jour., Oct. 12, 1912, p. 449.
2. THE JOURNAL A. M. A., June 18, 1910, pp. 2072 and 2076.
3. THE JOURNAL A. M. A., July 10, 1911, p. 30

auricle. Here rhythmicity is most highly developed and here it has been assumed that life takes its last stand at the spot where the cardiac pace-maker is located. In the hospital of the Rockefeller Institute for Medical Research at New York, Dr. G. Canby Robinson[1] has made records from patients before and during the actual stoppage of the heart, using the electrocardiograph, which can be employed without disturbing the individual in any way. Cardiac activity in some form or other may persist for more than half an hour after all the usual clinical signs of death have occurred — after respiration has finally ceased, when no heart signs can be heard, and muscular relaxation and the general appearance of the patient indicate that death has ensued. There was no uniformity in the changes in the mechanism of the heart-beat. Sometimes the ventricular outlasted the auricular activity; in other cases this was reversed; or the two parts of the heart were found to cease synchronously. Complete dissociation between the two divisions of the heart, ventricular fibrillation and other disturbances of coordination were among the phenomena noted. In view of such an inconstant variety of lethal phenomena Robinson is led to conclude that when death occurs from an acute infectious disease "there is no one point in the human heart which may be considered as the *ultimum moriens.*"

1 Robinson, G. Canby: A Study with the Electrocardiograph of the Mode of Death of the Human Heart, Jour. Exper. Med., 1912, xvi, 291.

A PREMATURE PUFF

The National League for Medical Freedom issues a monthly publication called *Medical Freedom.* In its October, 1912, issue, it quotes a somewhat lengthy article from the New York *Telegraph.* Part of this article follows:

> In view of the restoration to health of Miss Mabel Hite, the actress, it seems to be proper to point out to physicians that if they wish to wage successful war on Christian Science healers, they should accomplish what those earnest men and women do. Miss Hite is a popular actress known all over the country, and the theater-going public was shocked several months ago when it was announced on the authority of physicians that her days were numbered—she is only 26 years old.
>
> She was under the care of doctors. They used their knives on her body and dosed her with their drugs. "Affliction sore long time she bore; physicians were in vain." They told the public that she would die; and her manager called up the *Morning Telegraph* office and announced that the doctors had given her up. It was published broadcast.
>
> Then Miss Hite herself was told that she could not live, and at the suggestion of her mother she turned to Christian Science. Soon she was able to leave her bed; her weight increased; she went out for rides, and last Saturday attended a baseball game. She is on the road to recovery.
>
> Now the doctors were mistaken when they announced that she was dying, and Christian Science cured her. The public will believe with Miss Hite that the healers of Mrs. Eddy's church have made her well. They robbed death of its terrors, got her in a calm frame of mind, set their wills and hers to work, and the young woman began to get well.
>
> All this leads us to say that physicians who make mistakes in a matter of life and death should go slow in their criticism and their warfare on healers who really heal.

To all of which it is unnecessary to make any detailed reply, as the newspapers report that poor Mabel Hite died of cancer, Oct. 22, 1912.

THE TOXICITY OF THE URINE IN MEASLES AND OTHER INFECTIOUS DISEASES

It has been shown by Pfeiffer[1] that in anaphylactic shock and peptone poisoning the urine becomes extremely toxic. Aronson[2] has further demonstrated that in poisoning with Friedberger's anaphylatoxin, so-called, and also with poisons made of typhoid bacilli a similar toxicity occurs, and Esch[3] has demonstrated its occurrence in eclampsia. On the basis of this work, Aronson and Sommerfeld[4] have studied the toxicity of the urine in measles. The observation of von Pirquet that in measles during the exanthem there occurs an indifference to tuberculin in patients who have previously reacted strongly, they would explain as the result of an increased resistance to anaphylactic poisons in this disease. They found that during the attack there was a remarkable increase in the toxicity of the urine. Guinea-pigs injected intravenously with 2 c.c. of urine from healthy patients showed no noticeable reactions, but animals injected with urine from measles patients died usually in a few minutes or else became extremely ill, the symptoms resembling those of anaphylactic shock. Doses as small as 0.5 cm. were found to bring about typical reactions. The toxicity of the urine is not parallel to the severity of the illness, to the diazo reaction or to the passing of the exanthem. There is no rule as to the duration of the excretion of toxic urine, nor does the toxic action bear any relationship to the specific gravity. The toxicity is not lost by boiling or freezing, but the toxic substance is dialyzable. On reinjection it was found that a first dose gave no protection, and horse-serum also failed to protect. In a study of other infectious diseases it was found that a similar toxicity occurs in serum disease, whereas in scarlet fever no such poisonous urine is excreted. Aronson and Sommerfeld believe that whereas in measles the exanthem is an expression of anaphylaxis, in scarlet fever it is the direct result of the action of the causal organism on the skin. In typhoid, tuberculosis, diphtheria and pertussis the urine was found to be innocuous. These results are of interest and, if corroborated, may prove of importance. The demonstration of a relationship between measles, eclampsia, serum disease and poisoning with anaphylatoxins may be of value in determining the nature and etiology of the first two. It is also suggested that as an aid in differential diagnosis between measles and scarlet fever, between serum disease and scarlet fever and in other exanthems, this reaction may prove of considerable practical value.

1. Pfeiffer: Ztschr. f. Immunitätsforsch. u. exper. Therap., 1911, x, 550.
2. Aronson: Berl. klin. Wchnschr., 1912, xlix, 14.
3. Esch: München. med. Wchnschr., 1912, lix, 461.
4. Aronson and Sommerfeld: Deutsch. med. Wchnschr., 1912, xxxviii, 1733.

THE PHYSICIAN IS RESPONSIBLE

We present this week in the Propaganda for Reform department some facts regarding a widely advertised pseudomedical fraud — Duffy's Malt Whiskey. While this preparation is not so widely advertised in medical journals as it was, it still appears in the following:

Buffalo Medical Journal	*Therapeutic Record*
Medical Standard	*Charlotte Medical Journal*
Medical Summary	*Medical Brief*

PROGRESS AND REACTION

The influence of the propaganda against medical fakes is repeatedly shown and in no way better than in the changing attitude of publishers toward the admission of advertising matter. To the disgrace of the medical profession it must be said that as a class the publishers of lay journals are showing a greater desire to rid their advertising pages of fraudulent medical advertisements than are the publishers of medical journals. Hardly a week passes without some evidence of the fact. This week we have received a copy of the *Pulaski County Democrat*, a newspaper published at Winamac, Ind. By the same mail we also received a copy of a Colorado medical journal—the *Denver Medical Times*. The newspaper has an editorial entitled "Advertising Fakes," in which[1] the editor tells why the publishers turned down an advertising contract for the "consumption cure" fraud, "Nature's Creation." The medical journal, on the other hand, has an editorial entitled, "The Medical Index Expurgatorius and Independent Journalism," in which the editor boasts of the fact that the proprietary preparations advertised in his journal are not confined to those that have been accepted by the Council on Pharmacy and Chemistry for inclusion in New and Nonofficial Remedies. Incidentally he takes the opportunity to attempt to belittle both the Council and the American Medical Association. A glance at the advertising pages of the *Denver Medical Times* makes plain why the publishers of that journal are not willing to accept the findings of the Council on Pharmacy and Chemistry. Practically the whole of its advertising receipts are derived from the exploitation of proprietaries that either have not been approved by the Council or have at various times been shown to be fraudulent or worthless. "Nature's Creation" was examined in the Association's laboratory and found to be essentially a solution of potassium iodid in water and alcohol. To sell such a mixture as a cure for consumption is of course a fraud. When the *Pulaski County Democrat* was offered an advertising contract for the stuff, the publishers wrote to THE JOURNAL for information. On receiving the data furnished, they naturally refused to lend their advertising pages to perpetuate the fraud. "Papine," when examined in the Association's laboratory, was found to be essentially a watery-alcoholic solution of morphin with glycerin. It is sold under the claims that it does not "show habit-forming tendencies" and "does not suppress the secretions." Such claims for a disguised morphin preparation are just as fraudulent as the claims made for Nature's Creation; but the *Denver Medical Times* is perfectly willing to sell its pages to exploit this preparation—and many others that are just as bad—and to blackguard those men whom the American Medical Association has seen fit to appoint to investigate and expose fakes of this kind. Though it is typical of over two hundred medical journals published in this country, its importance as a medical journalistic factor would not have warranted its mention but for the coincidence of its arrival in the same mail with the *Pulaski County Democrat*. The attitude of the *Pulaski County Democrat* is typical of a large class of conscientious newspapers. The attitude of the *Denver Medical Times* is equally typical of a large class of self-styled independent medical journals—and the medical profession is to blame! Will physicians clean up abuses of this sort within the profession on their own initiative or will they wait until an outraged public opinion forces them to do so?

1. This editorial is reproduced in full in the Propaganda for Reform department, this issue.

Medical News

CALIFORNIA

Commission to Name Health Director.—The Oakland Civil Service Board has decided to throw open the eligibility list for candidates for head of the department of health of the city to practitioners all over the United States, and the following committee has been named to act with the civil service board to make the selections: Dr. W. F. Snow, Sacramento, secretary of the State Board of Health; Prof. Charles Gillman Hyde, head of the Board of Sanitary Engineering in the University of California; Dr. George W. Shaw, director of the State Hygienic Laboratory, and Drs. E. N. Ewer and H. G. Thomas, Oakland.

Medical Board Upheld.—Judge Sturtevant, in a decision made October 29, held that issuance of permits to medical specialists to practice their so-called specialties in California, without regular licenses to practice, is contrary to the constitution. The question was raised by a mandamus petition made by John L. Bohannon to compel the state medical board to issue him a permit to practice as a cancer specialist, declaring that he had conformed to all the regulations of the medical practice act, by showing that he had practiced his specialty for thirty-five years and for fifteen years of that time in the state. Judge Sturtevant's decision upholds the action of the medical board.

ILLINOIS

Contagious Disease Hospital.—It is reported that $65.000 has been raised for the North Shore Contagious Disease Hospital, Evanston. This leaves $35,000 to be subscribed.

One-Fifth of Town Ill with Typhoid.—The State Board of Health received notice, November 11, that sixteen cases of typhoid existed in Hillview, Green County, a village with a population of eighty. Dr. J. C. Westervelt, Shelbyville, assistant secretary of the state board, has been sent to Hillview to make investigations.

Personal.—Dr. Clarence E. Holmberg, Springfield, was seriously injured in a runaway accident November 12, and is under treatment in St. John's Hospital.——Dr. J. F. Blackwelder, Litchfield, was painfully injured in a runaway accident, November 11.——Dr. J. M. Hoyt, Fillmore, has been appointed local surgeon of the Clover Leaf System.——Dr. E. M. Eckard, Peoria, has been elected coroner of Peoria County.

Chicago

Larger Appropriation Needed.—Health Commissioner Dr. George B. Young has asked for an appropriation of $886.000 for the Health Department for 1913, an increase of $166,000 over the appropriation of 1912. This appropriation will include the money necessary to aid in the enforcement of the milk, cold storage, drinking-cup and towel ordinances and will provide also for the required addition to the corps of inspectors.

INDIANA

Physicians Equip Surgical Ward.—Physicians of Indianapolis have contributed the necessary funds to equip the surgical ward of the new building of St. Vincent's Hospital. The new institution will have accommodation for five hundred patients.

Personal.—Dr. C. B. Stemen, Fort Wayne, who has been ill for three weeks, has recovered.——Dr. E. A. Edmonds, Hebron, was seriously burned while assisting in putting out a fire at Hebron, November 7.——Dr. John M. Cunningham has succeeded Dr. Eugene B. Mumford as inspector of contagious diseases in the city board of health of Indianapolis.

KENTUCKY

Health Department Bulletin.—The monthly bulletin of the Louisville Health Department has appeared, bearing the title *Health and Hygiene*. In the November issue the bulletin features the hookworm investigation and also gives a number of terse health rules.

Personal.—Dr. William A. Young, Newport, has been appointed surgeon-in-chief of the Cincinnati Division of the Chesapeake and Ohio Railroad and Drs. Carey E. Wamsley, Newport, and S. P. Garrison, Bellevue, have been appointed assistant surgeons.——Dr. John W. Scott, Lexington, while on his way to New York, was stricken with appendicitis and was operated on in a hospital in Altoona, Pa.——Dr. J. T. Crice, assistant superintendent of the Central Kentucky State Hospital, Lakeland, has resigned.——Dr. Henry G. Hartman, Louisville, is suffering from septicemia following an injury to the right hand received while cranking his automobile.

Trachoma.—At the regular bi-monthly meeting of the Kentucky State Board of Health held in Louisville, November 14, one of the principal matters discussed was the report of Passed Assistant Surgeon John McMullen, U. S. P. H. Service, on trachoma as it exists in the mountains of Eastern Kentucky. The investigation included six mountain counties and one adjacent county. In all 3,974 persons were examined, 12½ per cent. of whom were found to be suffering from trachoma. For the purpose of this report, diagnosis was made only in positive cases, the suspicious or possibly incipient cases not being included. In Knott County about 18 per cent. were affected by the disease, including two out of twelve school children. In 400 persons not in schools, 102 cases of trachoma were found. In about 1,059 individuals examined in this county, 221, or about 20 per cent., were found to be suffering from trachoma. In the schools, the percentage of trachoma varied from 2 to 44 per cent., with a general average of about 18 per cent. In Perry County 310 persons were examined, 52 of whom, or about 16 per cent., had trachoma. In Breathitt County out of 614 persons examined, 12 per cent. were found to have trachoma. In Lee County, out of 668 pupils examined, 8 per cent. were found to have the disease. In Clark County in the Blue Grass region, in eleven schools containing 436 children, about 3 per cent. were found to have trachoma. The cure of existing cases is a problem which will require time and money. It was suggested that if possible a clinic, such as is now being held by Dr. J. A. Stucky in Lexington under the auspices of the W. C. T. U. Settlement School at Henderson, Knott County, should be established, that accurate records should be kept of the cases, and district nurses sent to follow the patients up, and see that the directions of the physicians are carried out. A system of movable or field hospitals should also cover the same territory periodically, in order to see the old patients and also any new patients, just as is now being done in the hookworm dispensary system.——The State Board of Health has decided to petition the United States Public Health Service to detail two men and such aids as may be necessary, to establish a series of dispensaries in cooperation with the Rockefeller Sanitary Commission and the State Board. In these dispensaries attention should be given to trachoma, tuberculosis, hookworm, pellagra and typhoid fever.

LOUISIANA

Sanitary Science at Tulane.—Three series of courses in sanitary science were started at Tulane University this session for medical science and engineering students specializing in sanitation. The medical graduates of this course expect to become health officers or members of boards of health; the science graduates, experts on sanitary biology, and the engineering, sanitary engineers. At Tulane the engineering and sanitary laboratories are on the same campus, and the School of Tropical Medicine has at its service the Charity Hospital clinics. In the senior class of the sanitary engineering course, instructions are to be given in water-supply, framed structures and reinforced concrete construction by Prof. Donald Derickson, formerly of Cornell University, and instruction in laboratory work and in sanitary microbiology will be given by Dr. Creighton Wellman and his assistants in the School of Tropical Medicine.

MARYLAND

Personal.—Dr. Jeptha E. Pitsnogle, Hagerstown, sustained serious bruises by the caving in of a well, recently.——Dr. Charles G. Hill, alienist of the Mount Hope Hospital, was struck by an automobile, November 12, and seriously injured.

New Officers.—Washington County Medical Association at Hagerstown, November 15: president, Dr. W. M. Reichard, Fair Play; secretary, Dr. W. D. Campbell, Hagerstown.

Baltimore

New Emergency Ward at Hospital.—The Baltimore and Ohio Railroad has decided to build an emergency ward at the Maryland University Hospital to cost about $5,000 and be in charge of Dr. Page Edmunds.

Hospital Fund Grows.—The building fund of the South Baltimore Hospital now amounts to $16,000. The trustees have decided not to commence work on the building until $20,000 has been secured.

Personal.—Dr. John C. Harris, an old practitioner of Baltimore, was stricken with cerebral hemorrhage October 31.——Dr. G. Milton Linthicum has been appointed assistant surgeon of the Fifth Infantry, N. G. Md., vice Dr. W. P. Morrill.——Dr. H. W. Kennard has been appointed assistant superintendent at the School for the Feeble-Minded, Owings Mills.

MISSISSIPPI

Vital Statistics Law Obeyed.—Reports from the Mississippi State Board of Health indicate that the vital statistics law, which went into effect November 1, is being conformed to, with very few exceptions, by physicians throughout the state.

Health Day.—Health Day was observed in Mississippi November 20. The exercises of the day were carried out by the State Board of Health, with the cooperation of the School Improvement Association and the Mississippi Federation of Women's Clubs.

NEW YORK

Small-Pox.—The State Health Department has been notified that there are seventeen well-developed cases of small-pox in Hancock, Delaware County.

Child Hygiene Bureau Opens.—The Bureau of Child Hygiene of the Buffalo Department of Health was opened October 24, with Dr. D. V. McClure in charge.

Personal.—Dr. C. S. Albertson has been elected president, Dr. James K. Stockwell, vice-president, and Dr. G. C. Elder, secretary of the medical staff of the Oswego Hospital.——Dr. and Mrs. A. J. Avery, Northville, celebrated their golden wedding anniversary recently.——Dr. James H. Donnelly has been appointed tuberculosis inspector by the health officer of Buffalo.

County Fair Health Exhibits.—The Bulletin of the State Department of Health for October describes the health exhibit which was exhibited by the department at a series of county fairs, acting in cooperation with the New York State College of Agriculture at Cornell University. A special circular entitled "Health Hints for Country Households," was distributed at the fairs; at Batavia 1,750 of these were put in farmers' wagons. Prof. H. N. Ogden of Cornell University and of the division of publicity and education of the department was in charge at the county fairs and was called on to answer many questions regarding ventilation, diphtheria antitoxin and adenoids. Antagonism to vaccination was frequently voiced and showed the need of educational effort in this direction. It is estimated that the exhibit has been visited by not less than 30,000 people.

New York City

Cancer Research Fund for Columbia.—Executors of the estate of George Crocker have filed their final accounting with the courts which shows that Columbia University has received from the estate $1,563,000 for the cancer research fund.

Reception to Dr. Carrel.—A reception was given in honor of Dr. Alexis Carrel of the Rockefeller Institute of Medical Research at the New York University, November 16, when the French ambassador delivered to Dr. Carrel the Nobel prize in medicine for 1912.

University Club Entertains Surgeons.—The University Club, Brooklyn, gave a dinner November 9 at which 300 were present, and among the guests of honor were Mr. W. Arbuthnot Lane, London, England, and Drs. William J. Mayo, Rochester, Minn., John B. Murphy and Albert J. Ochsner, Chicago; Robert C. Coffey, Portland, Ore.; George W. Crile, Cleveland, and Edward Martin and John Clark, Philadelphia.

Public Clinics.—The Department of Public Charities of the city of New York has issued orders which were communicated to the Academy of Medicine on November 7, that on and after the first of October, 1912, all clinics held in the amphitheater and operating-rooms of the hospitals of the Department of Public Charities shall be open to duly licensed graduates in medicine and to students in all regular organized medical schools and colleges. It was also ordered that tickets should be issued by the secretary of the Department of Public Charities for distribution by the secretaries of the several medical schools and societies of the City of Greater New York, which would entitle the registered holders thereof to admission to these clinics.

OHIO

New Officers.—Second District Medical Society at Dayton, October 24: Dr. W. H. Humphrey, Yellow Springs, president.

——Tenth District Medical Association at Mount Gilead, October 15: president, Dr. J. H. Jackson, Edison; secretary-treasurer, Dr. J. J. Coons, Columbus. The next meeting will be held in Columbus.——Seventh District Medical Association at Coshocton, November 7: president, Dr. E. B. Shanley; secretary, Dr. E. D. Moore, both of New Philadelphia.

Hospital News.—The entire building fund of $325,000 and $90,000 of the endowment fund have been raised for the new proposed Babies' Hospital, Columbus.——Dominican Sisters have opened a free dispensary in Columbus for the sick poor, in cooperation with the local society of St. Vincent de Paul. ——Creditors of the Eddy Road Hospital, Cleveland, are said to have filed a bankruptcy petition in the federal court and asked for a receiver.——The name of the Women and Children's Free Medical and Surgical Dispensary, Cleveland, has been changed to the Woman's Hospital of Cleveland.

Personal.—Dr. W. M. Bucher, Cleveland, has been appointed superintendent and resident physician of the Municipal Tuberculosis Sanatorium at Warrensville.——Dr. G. W. Garrison, Utica, is reported to be seriously ill as the result of a cerebral hemorrhage.——Dr. William T. Miller, Cleveland, has been reappointed a member of the State Board of Health.——Dr. James McKinley, Harrisburg, is reported to be seriously ill with nephritis.

PENNSYLVANIA

The Cost of Small-Pox.—Pittsburgh expended $42,624.91 in its recent efforts to avert an epidemic of small-pox.——The expense of the recent small-pox epidemic to Carbondale as estimated by the State Department of Health is $31,000.

Contagious Diseases.—In spite of the efforts to check the spread of diphtheria in Allentown, eight new cases were reported on November 11, making a total of 125. Dr. C. J. Hunt, associate chief medical inspector, found that cases were not properly followed up by health officers and all cases were not isolated. The reports of the health department, Harrisburg, show 11 cases of the disease reported in August, 30 in September, 95 in October and 24 so far this month.——Pittsburgh has succeeded in stamping out epidemics of small-pox and diphtheria, only to be followed by one of measles, 1,500 cases of that malady having been reported to the department of health of Allegheny County up to November 14.

Personal.—Dr. D. E. Sable, police surgeon of Pittsburgh, is under treatment at the South Side Hospital for a nervous breakdown.——Dr. Guy A. Gerberich, Lebanon, who has been seriously ill with typhoid, is reported to be improving.—— Dr. W. H. Robinson, Pottsville, is reported to be seriously ill. ——Dr. George R. Reich and family, Marietta, have returned after a stay of several months in Bassano, Canada.——Dr. George W. Seibert, Lebanon, who spent the summer recuperating in the Mound Valley region, has returned and resumed practice.——Dr. J. M. Maurer, Shamokin, who has been seriously ill, is reported to be improved.——Dr. Ulysses E. Dornsife is reported to be ill at his home in Tunkhannock.—— Dr. George Romig, Allentown, fractured his arm while cranking his automobile, October 28.

Philadelphia

Physicians' Home Urged.—At the meeting of the members of the Aid Association of the Philadelphia County Medical Society, November 11, Dr. Roland G. Curtin urged that steps be taken to establish a home in Philadelphia for aged and destitute physicians and their wives.

Portraits Presented to the College of Physicians.—At the meeting of the College of Physicians, November 6, portraits of the late John H. Musser, Isaac Hays and Wharton Sinkler were presented to the college by Drs. George A. Piersol, George E. DeSchweinitz and James C. Wilson, respectively.

To Collect Criminal Statistics.—The collection of statistics relating to crime in Pennsylvania is to be undertaken by the state branch of the American Institute of Criminal Law and Criminality. The committee selected to prepare this report consisted of Edward Linsey, John Lysle and Prof. William E. Mickle of the University of Pennsylvania.

New Dispensary for Tuberculosis Opened.—The free dispensary system, being built up by the state in its fight against tuberculosis, opened a new branch at 1126 South Twenty-Sixth Street, for the benefit of the Woodland and Darby sections of the city. This is the third branch now operating in this city and the one hundred and sixteenth to be established in the state. Dr. S. J. Repplier has been placed in charge of the new branch and will have two assistants and four nurses, the latter under the direction of Miss Alice O'Halloran. The dispensary will be open from 10 to 12, on Mondays, Tuesdays and Wednesdays. A staff of visiting nurses will investigate conditions in patients' homes and such applicants as are found to be in need of extended treatment will be entered at the Mount Alto Sanatorium.

TEXAS

New Clinic to Open.—A free surgical clinic is to be located at the Kenney Sanatorium, San Antonio, the latter part of December. Ten rooms of the new fifty-room addition to the sanatorium will be set aside for the treatment of cases from this clinic.

Medical Library Inaugurated.—The Dallas County Medical Society has started a library in the Southwestern building which is open to physicians and surgeons of Dallas. At present the library contains about one hundred medical journals and standard books of reference on various subjects in medicine.

Hospital News.—Contracts have been awarded for the erection of a fourteen-room hospital for Dr. R. M. Prather, Beeville.——Plans have been approved for the improvement and enlargement of the Temple Sanitarium to cost about $40,000. ——Plans are being considered for the remodeling of the Arlington Hotel, Marlin, and its conversion into a hospital.

GENERAL

New Officers of Southern Medical Association.—At the sixth annual meeting of the Southern Medical Association held in Jacksonville, Fla., November 12-14, the following officers were elected: president, Dr. Frank A. Jones, Memphis, Tenn.; vice-presidents, Drs. Stuart McGuire, Richmond, Va., and J. D. Love, Jacksonville, Fla., and secretary-treasurer, Dr. Seale Harris, Mobile, Ala. Lexington, Ky., was selected as the next place of meeting.

Mr. Flexner with General Education Board.—The General Education Board of 17 Battery Place, New York, announces that Mr. Abraham Flexner has become a member of its staff. Mr. Flexner is the author of "The American College" (1908), and of the bulletins on "Medical Education in the United States and Canada" (1910) and "Medical Education in Europe" (1912) issued by the Carnegie Foundation for the Advancement of Teaching.

The Congress on Mental Hygiene.—This organization which was in session during the last week at the College of the City of New York excited a great deal of interest and was not without practical results. An appeal for subscriptions was made to further the plans for a nation-wide educational campaign on mental hygiene, which resulted in the announcement that an unnamed philanthropist would give $50,000 toward an endowment fund for the purpose provided $200,000 could be raised from other sources. A large part of the hoped-for endowment would be applied to the establishment of research laboratories and hospitals in various parts of the United States where investigations in regard to the causes and cure of insanity can be carried on extensively.

Cholera.—Reports to the U. S. Public Health Service and press reports indicate that cholera is present to a very serious extent in various parts of the world, the most menacing situation perhaps being in the war-zone in Turkey. Official information concerning the cholera is meager or absent; but the belated and imperfect press reports indicate that cases are occurring in large numbers particularly among the Turkish and Bulgarian troops in the field and fortifications near Constantinople and also among the refugees in the city of Constantinople. Some newspaper reports give the number of cases occurring daily as up in the hundreds or even thousands. It is also reported that the troops of the allies contain many victims of the disease. On account of poorly-organized medical and sanitary forces, poor equipment, lack of food supplies, etc., the epidemic may assume tremendous proportions. On account of poor communication and probable suppression of news, the exact conditions cannot be stated.——No cholera was reported from Italy during the past summer except at Cagliari, Sardinia, where about seventy cases have occurred since August 1. ——The disease is present in many places in Japan but no large outbreaks have occurred, and public water supplies apparently are not infected.——The disease is also widely scattered throughout Southern Asia. The Public Health Service is carefully watching the situation and taking necessary precautions to prevent the importation of the disease from Europe. Reduced immigration and transshipment and the careful inspection of immigrants from Eastern Mediterranean points before embarkation at European ports will enable the authorities to keep the situation well in hand, and the danger of the entrance of cholera into the United States is probably slight.

The large number of cases in the war zone, however, affords a serious focus of infection from which the disease may spread to a considerable extent throughout Southern Europe and so to the United States.

Clinical Congresses.—The week of November 11 was most notable in New York for medical and surgical activity. In addition to the third annual session of the Congress of Clinical Surgeons of North America, many other organizations concerned with subjects pertaining to medicine and surgery held meetings. The Congress of Clinical Surgeons was perhaps the largest assembly of surgeons that the world has ever witnessed, there being over 2,600 registrations. The days were devoted to clinics and the evenings to scientific meetings. There were as many as 180 to 190 clinics in progress and 300 to 800 operations performed daily. One of the clinics most largely attended was that given by Mr. W. A. Arbuthnot Lane of London at the new Policlinic Hospital when between four and five hundred were present in the amphitheater. The clinics were so arranged that each visitor could see the most possible of the work being done in his specialty. The scientific sessions were held in the ball-room of the Waldorf-Astoria with the exception of the Thursday evening meeting which was held in the Academy of Music, in Brooklyn, where the congress was the guest of the King's County Medical Society. At the closing executive session of the congress resolutions were presented by Dr. Franklin H. Martin recommending that a special college of surgeons be established with power to grant a supplementary degree to the degree of medicine, which should be a fellowship in the proposed college. This would be equivalent to a post-graduate degree similar to the F.R.C.S. of Great Britain. Resolutions were also passed recommending a campaign of publicity on the subject of cancer of the cervix and a committee of five, consisting of Drs. Thomas S. Cullen, Baltimore; Howard C. Taylor, New York City; C. Jeff Miller, New Orleans; F. F. Simpson, Pittsburgh, and E. C. Dudley, Chicago, was appointed by the president to disseminate this information by having articles written to be published in the daily press or weekly and monthly magazines as might prove most expedient. The membership of the congress was so large that some method of limiting it to 2,000 members is under consideration. The officers elected for the following year were: president, Dr. George Emerson Brewer, New York; vice-president, Dr. W. W. Chipman, Montreal; general secretary, Dr. Franklin H. Martin, Chicago; general treasurer, Dr. Allen B. Kanavel, Chicago, and chairman of the committee on arrangements for 1913, Dr. E. Wyllys Andrews, Chicago. The nominating committee recommended Chicago as the next meeting place.

FOREIGN

The Red Cross at the Seat of War.—The Italian Red Cross expedition from Bari consisted of ten physicians, forty nurses and 150 beds with full equipment, according to the *Policlinico*. This expedition went to Montenegro and a similar expedition to Greece. The Red Cross of Montenegro is collecting subscriptions to fit out an expedition, and the Italian society is also equipping at Turin a complete ambulance service to proceed at once to Montenegro. The German Red Cross has equipped three expeditions and a large number of German physicians have gone from Germany to the seat of war. Drs. A. Dilger and A. Meyer of Heidelberg, with Professor Colmers of Coburg have gone to Bulgaria, with Drs. Kirschner and Schubert. From Switzerland have gone to Servia, Drs. Stierlin, Socin and Vischer of Basel, with several Danish physicians. Professor Coenen of Breslau has gone to Greece, and Drs. Liebert and Hitzler have gone to Turkey. The Austrian Red Cross has also sent expeditions and materials to Montenegro and Bulgaria. It is stated that the officers of the Austrian society have been authorized to spend up to $40,000.

LONDON LETTER

(From Our Regular Correspondent)

LONDON, Nov. 9, 1912.

The National Insurance Act

The new offer of increased remuneration to the physicians by the government (described in my previous letter) is receiving the careful attention of the British Medical Association. The council has issued a report to the divisions and representative body in which it is pointed out that a new situation has arisen, though many of the association's demands have not been granted. With regard to the income limit of ten dollars a week for insured persons, which it will be remembered was one of the association's "six points," the regulations of the act require the surrender of the principle of central bargaining and leave to the profession in each area to obtain such an income limit as they desire and are strong enough to enforce. Another of the cardinal points is that all questions of professional discipline should be decided exclusively by a body or bodies of physicians. While this demand has not been completely met an endeavor has been made to satisfy the desires of the profession while meeting the public demands for some representation of public interests on the tribunal established to hear complaints in which physicians are involved. The procedure in the case of charges brought by one physician against another and of charges brought by a patient against a physician, or vice versa, is explained in the regulations. The report concludes that while the proposed tribunal appears to offer a measure of security for a fair inquiry no regulations can be satisfactory which do not provide for right of appeal to a medical tribunal. With regard to the amount of remuneration the government's last offer is a capitation fee of two dollars from which deduction of thirty-six to fifty cents will be made for drugs while the association demands the same amount without any deduction for drugs.

The British Medical Association has addressed a letter of inquiry to the Chancellor of the Exchequer, Mr. Lloyd George, asking him to elucidate further several points in his recent address to the insurance commissioners, embodying his last offer (reported in my previous letter). The increased services of which he spoke mean an increased service as compared with that which has been obtained in lodge practice in the past or which the great majority of the insured in view of their restricted means could not afford to obtain on private lines. The standard which it is hoped that the physicians attending insured persons will reach and maintain is that which the best opinion in the profession itself would expect from a general practitioner in his ordinary work. The government fully recognizes that the professional instinct of the majority of physicians will lead them without further stimulus to do all that can reasonably be expected in the interest of their patients. With regard to the "modern methods of diagnosis" mentioned in his speech, the chancellor explains that physicians will not be expected to undertake work requiring skill and experience beyond that which the ordinary general practitioner can properly be expected to possess. If methods of investigation beyond his scope are necessary, he will only have to advise the patient as to the steps he should take. The physician will be expected to avail himself of all such facilities in the shape of expert assistance in investigations useful for proper diagnosis and treatment. In so far as such facilities do not exist, the government hopes that means will be found for encouraging their development and organization in due course.

A National Memorial to Lord Lister

At the Mansion House (the official residence of the Lord Mayor of London) a large and influential meeting was held for the purpose of establishing a fund for a memorial for the late Lord Lister. It is proposed that this shall take the form of a medallion in Westminster Abbey, a monument in the metropolis and an international Lister Memorial Fund for the advancement of surgery. The Lord Mayor presided and there were present some of the most eminent men in science (Lord Avebury, Sir Archibald Geikie, president of the Royal Society), in medicine (Sir Rickman Godlee, president of the Royal College of Surgeons, Sir Thomas Barlow, president of the Royal College of Physicians, Sir Francis Champneys, president of the Royal Society of Medicine, Professor Saundby, Sir William Osler, and Prof. Howard Marsh), and in politics (Lord Haldane, the Lord Chancellor and Lord Cromer).

The Automobile Death-Roll

The automobile peril described in a previous letter to THE JOURNAL continues to exercise the public and has led to questions in the House of Commons. Recent figures show that up to Oct. 7, 1912, 118 people were killed in the streets of London this year. On one day, September 19, as many as four persons were killed. Replying to a question, Mr M'Kenna, the Home Secretary, said that if, as a result of coroners' inquiries, criminal negligence were proved, proceedings would be taken. It was pointed out that at coroners' inquests the motor-bus companies were always represented by lawyers, whereas the relatives of the persons killed were generally too poor to be legally represented. He said that the public has the protection of the coroner and jury. When asked why motor vehicles were permitted to travel in the streets at excessive speed, seeing that the law provides that no motor vehicle should travel at a speed dangerous to the public, he replied that, in 1911, 893 drivers of motor-cabs

or omnibuses and 3,556 drivers of other motor vehicles were prosecuted in London for dangerous driving and that he was issuing instructions for the more stringent punishment of dangerous, negligent and reckless driving.

Maternity Benefit in Australia

The Federal Senate of the Australian Commonwealth has passed the third reading of a bill providing for the payment of a bonus up to a maximum of $25 in respect of every child born in Australia of white parentage. The payment has already begun. This sum is much greater than the maternity benefit in the old country provided for by the national insurance act, which amounts to only $7.50, but it must be borne in mind that here the purchasing power of money is much greater than in Australia.

Death Under Stovain

A man, aged 68, has died under spinal anesthesia induced by injection of stovain for an abdominal operation at St. Thomas' Hospital. After the operation had been satisfactorily performed his breathing became shallow, and although artificial respiration was resorted to and the heart was massaged, death took place in a few minutes. At the inquest the anesthetist explained that he had administered stovain in 350 cases and that this was the first patient he had lost.

PARIS LETTER

(From Our Regular Correspondent)

PARIS, Nov. 1, 1912.

Personal

Dr. Bégouin, *agrégé*, has succeeded Professor Chavannaz as professor of clinical gynecology at the Faculté de médecine of Bordeaux.

The death is announced of Dr. Henri Dor, aged 78. Dr. Dor was born at Vevey, Switzerland, and had been professor of ophthalmology at the Faculté de médecine at Berne. In 1876 he went to Lyons where he founded an independent eye clinic and the *Revue générale d'ophthalmologie*.

Dr. Paul Segond, professor of clinical surgery at the Faculté de médecine de Paris, has died of uremia at the age of 61. Dr. Segond was the son of Dr. L.-A. Segond. He received his medical degree in 1880 and three years later became *agrégé* of surgery and surgeon of the hospitals of Paris. In 1905 he obtained the chair of operative medicine and in 1907 he was named professor of clinical surgery, succeeding Professor Terrier. Since 1909 he had been a member of the Académie de médecine and last year was president of the Congrès français de chirurgie. Paul Segond wrote little but he possessed rare qualities as a surgeon. He had specialized in gynecologic surgery and through his facility in vaginal operations had perfected considerably the removal of uterine fibromas through the vagina.

Annual Meeting of the French Surgical Society

The twenty-fifth meeting of the Association française de chirurgie was held in Paris, October 7-12, with Professor Delorme, medical inspector general of the army health service, president. The meetings of the congress as usual were well attended not only by French surgeons but by surgeons from abroad.

PRACTICE OF SURGERY IN WAR

In his opening address the president regretted that no place is now given by the society, as formerly, to the subject of surgery in war. He gave a summary of present practice, which in some respects differs from ordinary surgery, as has been clearly shown in recent wars. One of the clearest examples is laparotomy in wounds of the abdomen by small projectiles. In the South African war leading surgeons were sent by the British government to the field of battle and they were surprised at the treatment of these wounds. Spontaneous healing was permitted systematically instead of direct intervention. Operations were done with the same care and skill as in hospitals in large cities, but the mortality among those operated on was greater than among those who were not operated on after being wounded. This was the experience in Cuba and in Manchuria, and can readily be accounted for. It is not possible to have the same mastery over conditions on the battle-field that one can have in a regular hospital, and an abdominal wound by a bullet from a distance is not so severe as one from the muzzle of a revolver; finally, in adding a new traumatism to one which already exists the surgeon interferes with spontaneous encapsulation and is liable to spread infection.

Surgery in war should have simplicity as its end. Delorme, although he believes in intervention at once in cases of severe wounds of the abdomen, lungs or heart, as a general rule nevertheless considers that in war intervention is contra-indicated.

DIAGNOSIS AND TREATMENT OF CICATRICIAL STENOSIS OF THE ESOPHAGUS

There was an interesting discussion as to the relative value in diagnosis of skiagraphic and fluoroscopic examination compared with esophagoscopy. According to Dr. Guisez of Paris, the Roentgen rays give two kinds of information; with the use of bismuth wafers they show the location of the trouble and with bismuth lactate they show the form and size of the stenosis. The fault of the rays is that they do not show the nature of the stenosis. Esophagoscopy alone can do this. As to treatment, one obtains the impression on reading the literature that when catheterization is impossible in the usual way, surgeons resort to severe operations which could have been avoided if they had tried dilatation with esophagoscopy, which, according to Guisez, succeeds in 95 per cent. of cases; and when ordinary catheterization is impossible, catheterization from below should be employed through a large opening in the stomach. Dr. Moure of Bordeaux believes that in careful hands simple methods usually give good results, but in severe cases one should not wait too long before making a stomach opening, for gastrostomy often permits catheterization and dilatation from below at the same time saving the patient from death by inanition. According to Dr. Depage of Brussels, retrograde dilatation is one of the best methods, provided that the stomach opening is large. Professor Forgue of Montpellier emphasized the usefulness of gastrostomy, as there are many constrictions impassable until gastrostomy has been done. Dr. Delagénière of Mans also expressed the opinion that the stomach operation has great importance. Under certain conditions it is enough to open the stomach, permitting complete relaxation of the esophagus, to overcome the stenosis. Professor Villar of Bordeaux, who described the first esophagostomy by the posterior mediastinal route in 1892, is of the opinion now that this is an operation to be avoided. In fact, severe operations for impassable stenosis ought to be discarded in favor of gastrostomy. According to Dr. Berard of Lyons, one should always begin in examining a patient by fluoroscopy and skiagraphy, for no matter how desirable esophagoscopy is, there are times when it cannot be done. This likewise was the opinion expressed by Professor Roux of Lausanne, according to whom it is easier for an ordinary practitioner to open the stomach than to employ the methods of the specialists. Dr. Moure, although a specialist, was unwilling to say that esophagoscopy is a panacea, because failures have been attendant on its use and even death has been caused.

EXAMINATION BY ROENTGEN RAYS IN SURGICAL AFFECTIONS OF THE STOMACH AND INTESTINES

Drs. Béclère of Paris and Mériel of Toulouse said that examination by Roentgen rays of the stomach and the intestine is the best method for showing the location, the relations, the form, the dimensions and the muscular functions of a large part of the alimentary tract. Latent ulcers are thus shown, beginning stenoses and tumors which ordinarily escape palpation. To clinical examination the Roentgen rays bring an element of exactness in the diagnosis of lesions, taking the place of exploratory laparotomy; and by permitting earlier intervention, they make surgical success possible in more cases with more lasting cures. Nevertheless, Professor de Quervain of Basel has shown the mistakes to which a Roentgen-ray examination may lead and has pointed out that this method has not superseded the clinical examination, for a simple examination with one or two hands often corrects errors which would have been made had the evidence of the rays alone been depended on. In regard to the stomach, for instance, exaggerated peristalsis, usually an indication of organic pyloric stenosis, may be simulated by involuntary contractions of the stomach such as are found in tabes. Ulcers and cancer located high near the cardia escape ordinary investigation, although it is easy to demonstrate them if the patient is placed in the right lateral decubitus or in a slanting position with the head low. The defective image of the pyloric region, the most important sign of cancer here, often results from insufficient emptying of the stomach before the test is made. In cases of doubt, examination in the right lateral position is an important adjunct. In other cases the defective image is clearly indicative of a tumor of the kidney, spleen, intestine, pancreas or one starting from the gall-bladder. As for the large intestine, skiagrams are often more difficult to interpret than those of the stomach, and it is not advisable to depend too much on bismuth injections for determining the form and the position of the large intestine. The method of choice is the administration of bismuth by way of the stomach with examination after from eight to twenty-

four hours. Numerous mistakes are made in the diagnosis of stenosis. The tapering form of the fecal mass, so frequent as a rule in the lower part of the colon, should not be interpreted as a sign of stenosis unless it recurs regularly in several skiagrams at the same place. Dr. Girard of Geneva calls attention to toxic symptoms following the use of bismuth subnitrate in skiagraphy. He prefers to use zirconium oxid although its opacity is a little less than that of bismuth. Barium sulphate recently has caused severe symptoms probably on account of impurities. Professor Hartmann of Paris is of the opinion that the stomach does not have the exact position which skiagrams indicate. He advises interpreting them with careful attention to anatomy, for every surgeon knows that in some wounds of the abdomen in which the intestine alone is involved, the stomach also would have had to be wounded if it were as low as the skiagram shows it to be. It is probable that the weight of the bismuth has an effect. In intestinal work, Hartmann prefers fluoroscopy, but it is necessary here to be on one's guard against intestinal contractions which under the influence of bismuth simulate a stenosis which does not exist. Bismuth should be taken by the mouth and examinations should be made at half-hour intervals that its retardation or stopping may be observed. Bismuth injection should not be used excepting for affections located low in the pelvic colon.

BERLIN LETTER

(From Our Regular Correspondent)

BERLIN, Nov. 2, 1912.

Clinical Position of So-Called Genuine Epilepsy

At the annual meeting of the German Neurologic Association, recently held at Heidelberg, the still unsolved question of the existence of genuine epilepsy was discussed by the distinguished investigators Professor Redlich of Vienna and Binswanger of Jena. According to Redlich, true epilepsy, in the ordinary sense, cannot be etiologically distinctly defined; at the most, an artificial boundary line can be drawn in this way. Neither does the form of attacks give any certain indication for the separation of genuine from organic epilepsy. Paralytic phenomena after the attacks, or symptoms of defective brain action in the intervals are more frequent and more intense in organic epilepsy, but occur also in the ordinary epilepsy. Permanent indications of mental defects (epileptic dementia) are very common in ordinary epilepsy, but may be absent; they also occur, on the other hand, in organic epilepsy if it had its beginning in childhood or youth. In the organic epilepsy there are found, in addition to the focal affections, diffuse changes, which may also occur in so-called genuine epilepsy. This disease also has a pathologic anatomy, and there are transitions between the two forms. The best plan is to drop altogether the name "genuine epilepsy" and for the present to define only the chronic form of epilepsy. Opposed to this there is acute epilepsy and cases of occasional epileptic attacks. The latter have a variable significance. In part of the cases there is possibility of a transition to chronic epilepsy. It is important in future to study the individual predisposition to epilepsy, originating under different conditions from the varying capacity of the brain for the epileptic reaction and to study the pathogenic conditions under which the epileptic seizure develops. In this way, actual insight into the pathology of epilepsy might be obtained.

THEORIES OF EPILEPSY

According to Binswanger, the clinical position of so-called genuine epilepsy affords at present opportunity for only a difficult and incomplete discussion. There are two directions in which the conception of "epilepsy" is progressing: The one is concerned almost exclusively with an anatomic and etiologic demonstration, and has established the view that the entire field of epilepsy must be separated from the functional neuroses and be classed with the organic diseases of the brain. The other direction retains the clinico-symptomatologic conception. According to the first view, the pathologic process in epilepsy is a chronic progressive one, which is manifested less in the seizures than in the various symptoms which occur during the intervals and in the progressive mental decay. Certain clinical facts, however, do not harmonize with this conception. Only part of the cases follow the chronic progressive course with mental deterioration (epileptic dementia). Further, there is a group in which a mental change without doubt occurs, which, however, does not consist in a deficiency of the mental processes, but in a peculiar change of character. These psychopathologic manifestations are sometimes stationary, sometimes they are subject to considerable variations, and occasionally they completely disappear. In the latter case it can generally be established that they were directly related to the paroxysmal pathologic condition.

Then there is a form of epilepsy, hitherto underestimated in its frequency and importance, which aside from the epileptic paroxysm or its equivalent, affords no evidence of any sort of psychic abnormality. This group includes people who rank intellectually very high. The majority of those so afflicted carry on their business and show no retrogression of their mental powers up to an advanced age. Further there are epileptics without dementia who may be regarded as having entirely recovered. According to Binswanger's own experience the number of these is even greater than has been estimated. Quite natural reasons (the disinclination of the patients to speak of their previous affection) make it difficult for us to obtain an exact numerical insight into this important question.

Considering the above clinical facts, the other theory of epilepsy regards the epileptic convulsive paroxysm as the most important in the clinical picture, and classifies under this disease only those cases in which at some period of life genuine epileptic seizures have occurred. Simple as this classification may be in the majority of cases of epilepsy, it is very difficult in the borderland cases. The groups of psycho-asthenic convulsions, of frequent slight attacks of narcolepsy, and emotional brain storms surely, in the majority of cases, do not belong to this conception of epilepsy.

ANATOMIC BASES OF EPILEPSY

The adherents of the purely anatomic epilepsy base their views almost exclusively on the investigations of Alzheimer, who has shown that in about 40 per cent. of all cases of genuine epilepsy there is a peculiar pathologic anatomic lesion, which should be designated as Alzheimer's gliosis. It affects the most superficial layers of the cortex, and particularly the cortical layer of the spinal cord and the layer of the small pyramidal cells. It is characterized by the fact that the increased gliomatous tissues to a certain extent fit into the architecture of the cerebral cortex. Alzheimer considers the defects of tissues and the consequent epileptic dementia as a result of the epileptic seizures, a conception which Binswanger has advocated for years. Accepting these data, one is justified in retaining the anatomic-etiologic group of epilepsy of organic origin, to which only those cases should be added in which macroscopic and microscopic recognizable lesions of the brain have caused the epileptic affection. These are in particular retarded development, such as diffuse lobar and focal sclerosis, fetal and post-fetal inflammatory degenerative processes, and acute focal affections of the nature of infectious encephalitis. They all may lead to idiocy and imbecility with epilepsy, or to cerebral infantile paralysis with epilepsy. Still, epilepsy may occur as a result of focal lesions due to acute infectious encephalitis, without retarded mental development.

The anatomic bases of the epilepsy may be disclosed in some of the cases by the peculiar way in which the epilepsy develops, or by distinct symptoms in the intervals and after the paroxysms. In other cases the infectious encephalitic affection remains completely concealed during life. Under organic epilepsy, according to the clinical-etiologic point of view, may be included the toxic, traumatic, chronic infectious and arteriosclerotic epilepsies. But even in these groups anatomic changes may be recognized, which certainly have some influence on the development, as in traumatic epilepsy. A sharp separation of organic epilepsy is consequently, as a general rule, impracticable. Only one group is left, that in which the epileptic disease has developed on the basis of a hereditary and congenital predisposition, or one acquired in early childhood without external cause. In some cases the conditions of the origin of this constitutional form of epilepsy are still entirely unknown. Yet, certain microscopically demonstrated hypoplasias of the brain permit the conclusion that in these constitutional forms finer morphologic defects in development play a rôle. Moreover, it is very probable that the sclerosis of the cornu ammonis, which is found in 50 per cent. of the cases of genuine epilepsy, belongs in this group of primary hypoplastic pathologic processes.

DISTURBANCES OF A DYNAMIC FORM

There still remains a group of uncertain etiology, which may, for the present, be designated as a purely dynamic form. This term is based on the assumption that the epileptic pathologic process, which Nothnagel called the "epileptic transformation," depends on a disturbance of the dynamic equilibrium of the central nervous system, a pathologic counteraction of exciting and inhibiting processes within the functioning organs. These disturbances of dynamic equilibrium lead to the epileptic paroxysm, which in the sense of Jackson and Gowers may still be regarded as a process of discharge

of a condition of extreme tension. These dynamic disturbances, which in the completely developed epileptic convulsive attacks set in motion a peculiar epileptic mechanism, and in the incomplete attacks only a part of the same, may be, moreover, caused by the most various injurious influences, acting as a rule in a chronic manner; sometimes by circumscribed, more or less extensive foci either within or outside of the brain and sometimes by toxic or general traumatic injuries which occasion this specific transformation by means of chemical disturbances of nutrition within the functioning cortical substance. Thus it is explained that in spite of the most various causes a disease can develop which with regard to its origin and course presents the most manifold individual variations, but on account of the common faculty of characteristic paroxysmal symptoms may even to-day be regarded as a clinical entity.

VIENNA LETTER

(From Our Regular Correspondent)

VIENNA, Oct. 20, 1912.

The Program of Medical Lectures at the Vienna University, 1912-1913

In the winter term of the Vienna medical school there will be given 468 different lectures and classes for students and postgraduates, eleven more than last year. The number of lecturers is also high, there being thirty-two ordinary professors, ninety-four extraordinary professors, and 152 privatdocents and assistants. It is interesting to see how these numbers are divided among the various branches of our art. There will be given four classes in history of medicine (which of late has become a favorite study here), twelve in histology and anatomy, fourteen in physiology, thirteen in medical chemistry, thirty-six in pathology and pathologic anatomy, eleven in materia medica, 102 in internal medicine, nineteen in laryngorhinology, nineteen in pediatrics, thirty-nine in surgery, eleven in dentistry, thirty-two in otology, thirty-one in ophthalmology, forty-two in gynecology and obstetrics, forty-two in dermatology, including syphilis, twenty-four in psychic medicine and seventeen in forensic, social and hygienic medicine. The increase in classes for specialists in otology, rhinology and laryngology is notable in late years. The number of regular students at the medical school during the last (summer) term was 2,057, against 1,880 during the preceding summer term; among them were 125 women (ninety-eight in the corresponding period of 1911). The constant increase of medical students during the last twelve years is noted, and is stronger than the increase of the population in this country. On the other hand, on account of the present war which requires military service from all able-bodied men in the Balkan States, we expect for the coming term a much smaller number of students from those countries. Otherwise, we would again encounter the usual difficulties of accommodating all those desiring to work in our medical and scientific institutions, which have led to energetic protests on the part of students against the government's parsimony in this particular branch.

Honors to Professor Kassowitz

The well-known specialist for diseases of children, Professor Kassowitz, recently celebrated his seventieth birthday and was the recipient of numerous honors on this occasion. The official congratulation took place at the meeting of the pediatric section of the Medical Society of Vienna, when the Faculty of Medicine, the Senate of the University, the Hungarian Society of Physicians and numerous corporations tendered their congratulations by delegates. A *Festschrift* was published in honor of the scientist, who on this occasion delivered a most interesting lecture on "Facts and Theories and Their Influence on Natural Science and Medicine." He emphasized the necessity of being on the lookout for unverified popular theories. Professor Kassowitz is also at the head of the anti-alcohol movement in this country.

An Annex to the Anatomic Institute

The number of students who can be accommodated in the anatomic institutes of Vienna is altogether out of proportion to the number who apply for admission. The government has hitherto paid no attention to the demands of the medical faculty and the students who asked for new facilities but now has granted an appropriation for a third anatomic theater capable of holding, like the present two, 250 students, making a total capacity for 750 students. In one or two years the institute will be enlarged by adding a large museum and laboratory hall. At a meeting of students the addition of the two dissecting-rooms was declared insufficient and the erection of an appropriately large institute was urgently demanded.

Marriages

WILLIAM HENRY BEARDSLEY, M.D., Springfield, Mass., to Miss Anna Jackson Harkness of Springfield, Vt., October 29.

FREDERICK N. HENDERSON, M.D., Rockville, Md., to Miss Gussie Glenn Lamar, at Memphis, Tenn., November 3.

HENRY DAWSON FURNISS, M.D., New York City, to Miss Ruth Kellogg Pine of Troy, N. Y., November 18.

WILLIAM EDWARD HARTIGAN, M.D., to Miss Gertrude Gladding, both of Norwich, N. Y., November 7.

ALFRED LAWRENCE RHOADS, M.D., Scranton, Pa., to Miss Lou Eagles of Stroudsburg, Pa., November 12.

ROBERT PAGE COOK, M.D., Front Royal, Va., to Miss Nellie V. Jones, at Front Royal, November 2.

EDWARD HARRIS GOODMAN, M.D., Philadelphia, to Miss May Dudley of Camden, N. J., November 9.

JAMES ALEXANDER CRAIG, M.D., Gary, Ind., to Miss Mary Arnold of Lebanon, Pa., November 12.

ROBERT LEWIS RHODES, M.D., Roanoke, Va., to Miss Margaret Farmer of Louisville, Ga., October 25.

BENJAMIN FRANKLIN SAYLOR, M.D., Redding, Cal., to Miss Alice Taylor of St. Louis, November 7.

GEORGE KINEHART, M.D., Cassville, W. Va., to Miss Lena Grace Core, at Cassville, November 8.

JUDSON E. HAIR, M.D., to Miss Ivy J. Kinney, both of Baltimore, in Philadelphia, October 23.

ABRAHAM POTASNIC, M.D., Meridian, Miss., to Miss Dora Cohen of Milton, Fla., October 6.

JACKSON R. CAMPBELL, M.D., to Miss Mary Anderson, both of New York City, November 7.

THOMAS RODNEY CHAMBERS, M.D., to Miss Martha V. Sisson, both of Baltimore, November 6.

JUDSON TEETER, M.D., to Miss H. Elizabeth Seng, both of Pleasant Hill, O., November 10.

WESLEY HARTMAN RENNIE, M.D., U. S. Navy, to Miss Lita Jaques of Chicago, November 7.

FRANK K. ROY, M.D., Clarence, Mo., to Miss Pearl Keller of Kansas City, Mo., November 2.

HARRY JAMES HOAG, M.D., to Miss Elizabeth Dunn, both of Mora, N. Mex., September 25.

FRANK ASBURY OSINCUP, M.D., to Miss Mary Wodring, both of Waverly, Ia., November 7.

GEORGE B. FLETCHER, M.D., Lonoke, Ark., to Miss Vera Blood of Grayville, Ill., October 23.

WILSON J. FERGUSON, M.D., to Miss Willa Burke, both of Sedalia, Mo., October 31.

WILLIAM EBY, M.D., to Miss Ruby I. Thompson, both of Baltimore, October 26.

JOSEPH C. FRIEDMAN, M.D., to Miss Beatrice Shaffner, both of Chicago, November 12.

Deaths

John William Mallet, M.D. Tulane University, New Orleans, 1868; a member of the Medical Society of Virginia and a chemist of distinction; died at his home in Charlottesville, November 7, from pulmonary embolism, aged 80. He was graduated from the University of Dublin in 1853 and a year later became assistant professor of analytical chemistry at Amherst (Mass.) College; and from 1855 to 1860 he was professor of chemistry in the University of Alabama, Mobile. During the Civil War he served in the Confederate service and was in charge of the ordnance laboratories. At the close of the war he was made professor of chemistry in the University of Louisiana and later professor of analytical, industrial and agricultural chemistry at the University of Virginia, active from 1872 until 1908, and professor emeritus since that time. Dr. Mallet had also served at various times as professor or lecturer at Johns Hopkins University, Baltimore; the University of Texas, Galveston, and Jefferson Medical College and for three terms was a member of the United States Assay Commission. He had been honored by the degree of Ph.D. from the University of Göttingen and that of LL.D. from William

and Mary College, the University of Mississippi, Princeton University, Johns Hopkins University and the University of Pennsylvania. Dr. Mallet was a frequent contributor to the chemical literature; he was a member of scientific bodies at home and abroad and was one of the most distinguished chemists of the United States.

Robert Fletcher, M.D. M.R.C.S., England, 1844; principal assistant librarian in the library of the surgeon-general's office, Washington, D. C., since 1886; died in his apartment in Washington, November 8, aged 89. Dr. Fletcher was born in Bristol, England, March 3, 1823. He served throughout the Civil War, first as surgeon of the First Ohio Volunteer Infantry, then successively as assistant surgeon, and surgeon, U. S. V.; and was mustered out in 1867. He was a member of the American Medical Association; Medical Society of the District of Columbia; National Geographic Society; Philadelphia College of Physicians and other learned societies. In 1910 Dr. Fletcher was awarded the gold medal of the Royal College of Surgeons of England in recognition of his distinguished services in connection with the indexing of the catalogue of the Surgeon-General's Library. He was lecturer on medical jurisprudence from 1884 to 1886 and professor from 1886 to 1888 in the Columbian University, Washington, and later was lecturer on forensic medicine in Johns Hopkins University. He was a frequent contributor to the literature of the history of medicine and anthropology.

Franklin Buchanan Smith, M.D. University of Pennsylvania, Philadelphia, 1878; a member of the American Medical Association; once president of the Medical and Chirurgical Faculty of Maryland, and for several terms president of the Frederick County Medical Association; first health officer of Frederick City and County, Md.; a member of the State Board of Medical Examiners since its organization in 1892; for ten years a member of the local U. S. Pension Examining Board; for eight years physician to Montevue Hospital; and for more than twenty years local surgeon of the Baltimore and Ohio and Pennsylvania systems; died at his home in Frederick, November 5, from typhoid fever, aged 56.

Bradford S. Galloway, M.D. University of Michigan, Ann Arbor, 1880; for twenty-three years a practitioner of Leadville, Colo.; chief surgeon of the Colorado Midland Railway for three years and local surgeon for the Colorado Southern Railway for twenty years; who moved in 1901 to Denver and two years later to Goldfield, Nev., and had been for four years a resident of Los Angeles; died suddenly in a restaurant in that city, November 2, from embolism, aged 58.

John Denham Palmer, M.D. University of Maryland, Baltimore, 1872; of Jacksonville, Fla.; a member of the Florida Medical Association; formerly chief surgeon of the F., E. and P. Railroad; who took a prominent part in the yellow-fever epidemics in Memphis, Tenn., and Fernandina and Jacksonville, Fla.; died in St. Luke's Hospital, Jacksonville, from the effects of an accidental gunshot wound, November 3, aged 62.

John T. Mitchell, M.D. Jefferson Medical College, 1880; a member of the Missouri State Medical Association; for twenty-five years a practitioner of Kansas City; professor of anatomy in the Western Dental College and lecturer in the Kansas City School of Pharmacy; died in St. Luke's Hospital, Kansas City, November 4, from pneumonia, aged 65.

James Stuart Dickey, M.D. Queens University, Belfast, Ire., 1910; senior demonstrator of anatomy in his alma mater; professor of anatomy in the Western University, London, Ont.; committed suicide in the pathologic laboratory of that institution September 21, by gas asphyxiation while suffering from melancholia, aged 30.

Lucius Wadsworth Clarke, M.D. University of Vermont, Burlington, 1863; assistant surgeon of the Thirteenth Connecticut Volunteer Infantry until the close of the Civil War; for forty-six years a practitioner of Cambridge, Wis., and for two years president of the village; died at his home, November 3, from senile debility, aged 81.

John Thomas Duncan, M.D. University of Toronto, Ont., 1882; of Toronto; for many years lecturer in anatomy at the Medical College for Women and oculist to the Western Hospital; who retired from practice about six months ago on account of bronchitis; died in California, November 4, aged 59.

Lewis John Davis, M.D. University and Bellevue Hospital Medical College, 1899; of Watertown, N. Y.; was found dead in his room in the Hotel Marlborough, New York City, November 4, it is believed from the effects of an overdose of morphin, aged 45.

William H. Robinson, M.D. University of Pennsylvania, Philadelphia, 1868; for several years visiting physician to the Pottsville Hospital; a member and for several years president of the Pottsville City Council; secretary of the Board of Health, and registrar of the State Department of Health; died at his home, November 4, from disease of the kidney.

Lynn Boyd Graddy, M.D. University of Nashville, Tenn., 1874; once president of the Tennessee State Medical Association and Nashville Academy of Medicine; for twelve years professor of diseases of eye, ear, nose and throat in his alma mater; from 1884 to 1888 a resident of Omaha; died at his home in Lexington, Tenn., November 11, aged 67.

Louis S. J. Gessner, M.D. University of Heidelberg, Germany, 1858; assistant surgeon of the Thirty-Seventh Ohio Volunteer Infantry during the Civil War; a pioneer practitioner of Sandusky County, O.; died at the home of his daughter in Fremont, November 4, from paralysis, aged 82.

Walter Henry White, M.D. Boston University School of Medicine, 1882; a member of the American Medical Association; formerly president of the American Electro-Therapeutic Association and associate editor of *Advanced Therapeutics;* died at his home in Boston, about November 6, aged 66.

Marietta Huntington Crane Woodruff, M.D. New York Medical College and Hospital for Women, New York City, 1874; one of the first women to practice medicine in New Jersey; died at her home in Boonton, November 6, from hemorrhage following an attack of coughing, aged 75.

Randolph Littrell Collins, M.D. Medical College of Virginia, Richmond, 1910; of Woodlawn, Va.; a member of the American Medical Association; died in the University Hospital, Richmond, November 3, from peritonitis following an operation performed several days before, aged 25.

Benjamin F. W. Urban, M.D. University of Pennsylvania, Philadelphia, 1869; court crier of Court No. 2, Lancaster, Pa.; clerk of the Quarter Sessions Court for two terms; a veteran of the Civil War; died at his home in Lancaster, November 3, from angina pectoris, aged 66.

Claudius Galen Treichler, M.D. University of Pennsylvania, Philadelphia, 1865; a member of the American Medical Association and a fellow of the American Academy of Medicine; died at his home in Honeybrook, Pa., November 2, from heart disease, aged 72.

John Eugene Monroe, M.D. Cleveland University of Medicine and Surgery, 1893; for nineteen years a practitioner of Orange, Mass.; died in the Memorial Hospital, Worcester, Mass., November 5, after an operation for the removal of carbuncle, aged 53.

Frank Lincoln Hamilton, M.D. University of Pennsylvania, Philadelphia, 1893; a member of the Medical Society of the State of Pennsylvania and for eighteen years a practitioner of Chester; died at his home, November 4, from cerebral hemorrhage, aged 47.

Charles C. Knapp, M.D. University of Tennessee, Nashville, 1893; a member of the American Medical Association and a specialist on diseases of the eye; died at his home in Zanesville, O., November 5, from cerebral hemorrhage, aged 48.

Thomas Benton Marquis, M.D. Bellevue Hospital Medical College, 1877; since 1882 president of the local board of pension examining surgeons of Lisbon, O.; died at his home, November 5, from uremia, following pneumonia, aged 58.

Clarence Albert Baker, M.D. College of Physicians and Surgeons, New York City, 1886; health officer of the town of Brookhaven and physician of Suffolk County; died at his home in Yaphank, L. I., New York, November 8, aged 50.

Emory Strickler, M.D. Eclectic Medical Institute, Cincinnati, 1865; first superintendent of Schools of Harrison County, Va.; a veteran of the Civil War; died at his home in Shinnston, W. Va., October 25, from senile debility, aged 84.

Leo H. O'Meara, C.M., M.D. Queens University, Kingston, Ont., 1911; formerly of Fallowfield and Ottawa, Ont.; surgeon to the Algoma Central and Hudson Bay Railroad; was accidentally drowned at Hobon, Ont., November 2.

Andrew Thomas Brenton (license, Iowa, 1887); an early practitioner of Sac City, Ia., but for a few years past a resident of Florida; died at the home of his son in Havelock, Ia., October 26, from cerebral hemorrhage, aged 69.

William Marmaduke Owen (license, Jefferson County, Ala., 1887); a Confederate veteran and for forty years a practitioner of Texas, and Jonesboro, Ala.; died at the home of his son in Dora, Ala., November 5, aged 77.

Willard P. Brickley, M.D. American Medical College, Cincinnati, 1856; one of the founders of the Physio-Medical College of Indiana, Indianapolis; a resident of Madison County, Ind., for seventy years; died at his home in Anderson, November 10, aged 89.

Homer Simpson Bell, M.D. Dartmouth Medical School, Hanover, N. H., 1873; for many years a practitioner and town clerk of Granby, Mass.; died at his home in Springfield, Mass., November 3, from diabetes, aged 61.

Jacob Ellsworth Ernest, M.D. Jefferson Medical College, 1892; formerly of Williamsburg, Pa., but since 1896 a practitioner of Johnstown, Pa.; died in the Johnstown City Hospital, November 1, aged 48.

Marion Francis Shaw, M.D. Bellevue Hospital Medical College, 1884; formerly health officer of Hood River County, Ore.; died on his ranch near Hood River, October 31, from heart disease, aged 54.

David Henry Agan, M.D. Bellevue Hospital Medical College, 1879; a member of the Medical Society of the State of New York; died at his home in New York City, November 6, aged 64.

Joseph E. Fopeano, M.D. Long Island College Hospital, Brooklyn, N. Y., 1889; a member of the Medical Society of New Jersey; died at his home in Hoboken, October 4, aged 56.

Thomas Stanhope Henry, M.D. Medical College of Virginia, Richmond, 1866; of Brookneal, Va.; died November 11, at the ancestral home of the Henry family, Red Hill, Va., aged 80.

Andrew H. Diven (license, Oregon, 1889); a practitioner of Pennsylvania from 1861 to 1889 and thereafter a resident of Portland, Ore.; died at his home, October 30, aged 76.

William H. Dorsey, M.D. Georgia College of Eclectic Medicine and Surgery, Atlanta, 1897; died at his home in Griffin, Ga., October 26, from cerebral hemorrhage, aged 42.

Simeon G. Story, M.D. University of Toronto, Ont., 1893; one of the best known practitioners of Kent County, Ont.; died at his home in Blenheim, November 4, aged 47.

Henri Riedelle Thayer (license, Mass., act of 1894); for thirty-five years a resident of Boston; died at his home, November 1, from senile debility, aged 93.

James Edward Gregory, M.D. Illinois Medical College, Chicago, 1905; a colored practitioner of Gainesville, Tex.; died at his home November 7, from pneumonia.

Edgar DuBois Biddle, M.D. Missouri Medical College, St. Louis, 1880; of Patoka, Ind.; died in a hospital in Chicago, November 7, from paralysis, aged 55.

Elwood MacDonald Blakely, M.D. Manitoba Medical College, Winnipeg, 1907; was found dead in his office in Elm Creek, Man., about October 31, aged 30.

Raymond Albert Young, M.D. University of Michigan, Ann Arbor, 1909; died at the home of his parents in Grand Rapids, Mich., November 2, aged 26.

Henry George Small, M.D. College of Physicians and Surgeons, New York City, 1875; died at his home in Brooklyn, N. Y., November 8, aged 60.

Edmund H. Packer, M.D. Homeopathic Medical College of Pennsylvania, Philadelphia, 1867; died at his home in Lowell, Mass., October 10, aged 68.

William A. Edwards, M.D. Physio-Medical College of Indiana, Indianapolis, 1898; died at his home in New Douglas, Ill., October 22, aged 41.

William W. Jones, M.D. Eclectic Medical Institute, Cincinnati, 1881; died at his home in Utica, N. Y., November 8, from nephritis, aged 55.

Joseph Pfeiffer, M.D. University of Giessen, Germany, 1853; died at his home in New York City, October 31, from senile debility, aged 85.

Almond A. Stuart (license, Indiana, 1897); was shot and killed in the door-yard of his home at Fortville, Ind., November 7, aged 68.

Joseph W. Kitten, M.D. Jenner Medical College, Chicago, 1906; died at his home in Chicago, November 2, from pneumonia; aged 44.

William Commons, M.D. Medical College of Ohio, Cincinnati, 1863; died at his home in Union City, Ind., October 27, aged 76.

W. C. Ashley, M.D. Atlanta (Ga.) Medical College, 1884; died at his home in Ocilla, Ga., November 9, from nephritis.

The Propaganda for Reform

IN THIS DEPARTMENT APPEAR REPORTS OF THE COUNCIL ON PHARMACY AND CHEMISTRY AND OF THE ASSOCIATION LABORATORY, TOGETHER WITH OTHER MATTER TENDING TO AID INTELLIGENT PRESCRIBING AND TO OPPOSE MEDICAL FRAUD ON THE PUBLIC AND ON THE PROFESSION

DUFFY'S MALT WHISKEY

"Patent Medicine" or Poor Liquor—Which?

What is this widely advertised fraud, sold as a "consumption cure," claimed to be the "greatest known heart tonic" and a preparation that "builds up the nerve tissues, tones up the heart, gives strength and elasticity to the muscles and richness to the blood?" The answer to this question will be found to depend, apparently, on when it is asked.

During the Spanish-American war Duffy's Malt Whiskey qualified as a "patent medicine" by the payment of the special tax that was put on nostrums as a means of raising revenue. In a circular issued at that time by the Treasury Department it was stated:

> "The Duffy Malt Whiskey Company have, by evidence under oath filed in this office, shown that their compound called 'Duffy's Pure Malt Whiskey' is composed of distilled spirits in combination with drugs. . . . "

On the other hand, even while the Federal Government was declaring the stuff a "medicine," the Supreme Court of the state of New York decided that Duffy's Malt Whiskey was not a medicine but a liquor and that persons selling it would be required to pay the same excise tax and to procure the same liquor-tax certificate that were required of the sellers of any other whiskey. The way in which the New York courts came to pass on this question is an interesting chapter in "patent medicine" history.

THE PAXSON CASE

A New York City druggist named Paxson sold Duffy's Malt Whiskey without first having paid the liquor license. The New York state excise department proceeded against the druggist for so doing. Paxson's defense was that Duffy's Malt Whiskey was not a liquor but a medicine and it was, therefore, not subject to the liquor laws of the state of New York. When the case came to trial, the New York authorities called as witnesses three chemists, Dr. Joseph De Guehuee, Dr. Charles A. Crampton and Dr. Edward W. Wheeler.

WHAT THE CHEMISTS FOUND

Dr. De Guehuee, who at that time was chief chemist in the Health Department of the City of New York, testified that he had analyzed Duffy's Malt Whiskey and he reported in part:

> "I found the contents of the bottle to be whiskey, with a little cane sugar added to it, a sweetened whiskey . . . I found no other ingredients. My examination would have revealed any other ingredients present in quantities sufficient to be determined by chemical analysis."

Dr. Crampton, the chief chemist of the Internal Revenue Bureau of the Treasury Department in Washington, reported his results in part as follows:

> "I have made an examination of the substance known as Duffy's Malt Whiskey . . . I found it contained no medicinal ingredients outside of the alcohol in the whiskey. . . . It is whiskey of a very poor quality as a beverage . . . it is not whiskey which, according to the pharmacopeial standard has been aged. . . . The taste of this bottle is indicative of a rather poor quality of whiskey, what is known as young whiskey or raw whiskey; it has not the full flavor and aroma of an aged whiskey."

Dr. Wheeler, a chemist of the New York state Department of Agriculture, testified that he had analyzed Duffy's Malt Whiskey:

> "In my opinion, there is no appreciable drug or medicine in Duffy's Malt Whiskey. There was about 1 per

cent. of solids in the bottle which I analyzed. The solid was largely sugar. There was coloring matter."

WHAT THE DUFFY PEOPLE CLAIMED

The courts assessed against Paxson a judgment of more than $700. Paxson then appealed the case to the New York Supreme Court, which refused to set the judgment aside and assessed him further costs for the refusal. Then the Duffy Malt Whiskey people showed their hand. They took up the matter and a motion for a new trial was argued on the ground that new and important evidence had been found. In affidavits submitted by the Duffy Malt Whiskey Company, Clarence E. Sherin, president of the concern, declared that Duffy's Malt Whiskey contained, in addition to alcohol, the following drugs:

Fluid extract calumba (columbo)
Fluid extract hydrastis (golden seal)
Fluid extract pareira (Pareira Brava)
Fluid extract taraxacum (dandelion).

Dr. Richard Curran, Rochester, N. Y., declared under oath:

"That he personally prepares the tincture made from the following drugs, viz.: Fluid Extract Calumba (Columbo), Fluid Extract Hydrastis (Golden Seal), Fluid Extract Pareira (Pareira Brava), Fluid Extract Taraxacum (Dandelion), under direction of the Duffy Malt Whiskey Company, which tincture he knows to be used in the preparation of the medicinal compound known as Duffy's Pure Malt Whiskey. His knowledge that these medicinal agents are used is because of the fact that he personally delivers the same to Walter J. Duffy, vice-president of the Rochester Distilling Company."

He further declared:

"That he himself personally makes the medicinal tincture, and from his own knowledge, says that the character of the product and its effect on the system is in marked contrast with any straight whiskey; in fact, he regards it as a whiskey in name only; a medicine of the greatest value, in fact."

It will be noticed that the *amounts* of the drugs alleged to be put in the whiskey are not given. Further affidavits were filed in the case from several Rochester physicians each of whom had some words of praise for this stuff.

SOME SWORN TESTIMONIALS

DR. WILLIAM B. CONNER regarded Duffy's Malt Whiskey "as a valuable curative agent" which he had "had occasion to use . . . in his practice."

DR. W. HOBART CURTIS affirmed that "the effect of Duffy's Pure Malt Whiskey is different from that of any other whiskey. . . ."

DR. EDWIN S. HAYWARD, JR., swore that he considered the stuff "a medicine of widely acknowledged value" and that it has been his habit to prescribe it "in cases where the activities have been at low ebb."

DR. HARRY M. SCHALL declared under oath that "on numerous occasions he has used Duffy's Pure Malt Whiskey in his practice."

DR. J. SHERBURNE READ declared that "Duffy's Pure Malt Whiskey has been used and prescribed by him for a number of years." Incidentally it may be mentioned that Dr. Read at present is the "director" of the Okola Laboratory, a fraudulent mail-order medical concern operated by the Neal-Adkin syndicate.

DR. GEORGE W. GOLER, who at that time was health officer of the city of Rochester, declared that he "has been informed of the drugs used in medicating Duffy's Pure Malt Whiskey and with this information and his knowledge of the power of such drugs, he is free to say that the quantity and quality of the medicines so employed substantially transform the liquor from the condition of being purely a whiskey to a medicated compound."

DR. JOHN A. STAPLETON deposed that "he was made acquainted with the method of medicating Duffy's Pure Malt Whiskey and the drugs employed for the purpose" and was "of the opinion that the liquor during such medication undergoes a decided change."

DR. J. J. A. BURKE swore that "he was aware from the beginning that Duffy's Pure Malt Whiskey was being medicated" and further that he "knew of the ingredients employed for the purpose and thought them good."

DR. RICHARD M. MOORE declared that he was "convinced that the liquor can *no longer* be considered a stimulant pure and simple, but a medicated combination by the solvent power of alcohol." [Italics ours.—ED.]

DR. WILLIAM M. BARRON stated that "he knows the remedies employed in medicating Duffy's Pure Malt Whiskey" and "unhesitatingly considers that this whiskey is changed in a marked degree by the introduction of these drugs."

Thus did these Rochester physicians solemnly declare that Duffy's Malt Whiskey was a "patent medicine" and not a cheap whiskey. Nevertheless, the analyses made by three chemists, working independently, conclusively proved that there were no drugs present in sufficient quantities to be demonstrable by chemical analysis! Again it should be noted that while the Duffy concern swore that drugs were put into its whiskey, it was careful to avoid giving any information regarding the quantities of the drugs that were alleged to be added.

The state chemists of North Dakota subjected this product to chemical analysis and in the Agricultural Experiment Report for 1906 declared:

"Analysis indicates it to be nothing more than neutral spirits, colored and flavored. The amount of solids is high because it has syrup added to make it 'smooth' and give it flavor."

POLITICAL INFLUENCE PROTECTS A FRAUD

For years, Duffy's Malt Whiskey has gone out to the public with the most flagrantly false and fraudulent claims made for it on the wrapper around the bottle. The government officials finally took action and in 1908 a quantity of Duffy's Malt Whiskey was seized on the charge of being adulterated and misbranded under the Food and Drugs Act. What happened? It appears that the Hon. James Breck Perkins, member of Congress from Rochester, at once "got busy."

At the time of the prosecution by the state of New York, Mr. Perkins was attorney for the Duffy Malt Whiskey Company and it was he who filed the brief in behalf of the company in support of the motion for a new trial. Mr. Perkins, at that time, was apparently highly incensed by the activities of the state authorities against Duffy's Malt Whiskey. In closing his brief at that time, Mr. Perkins expressed himself thus:

"It does not seem to me that the officers who represent the state in any proceeding, and certainly not in criminal proceedings, are required to exhibit so extreme a zeal."

Apparently zeal, in a public officer acting against large vested interests, however fraudulent, is something that Mr. Perkins would not tolerate. It is not surprising, then, that when the Department of Agriculture seized a large consignment of Duffy's Malt Whiskey, Congressman Perkins should rush to the rescue. The incident was described somewhat fully by *Collier's* at the time. According to that paper, Perkins wrote his first letter on the official stationery of the House Committee on Foreign Affairs of which committee he was a member. It read in part:

"The Duffy Malt Whiskey Company . . . is controlled by our most prominent and leading citizens and *I trust matters can be adjusted in such a way as not to injure a long established industry.*"

He wrote a second letter, it is claimed, this time on the official stationery of the Printing Committee. In addition, letters were written by various other prominent politicians of western New York and a dozen personal visits were made to Washington. No less than six different officers of the Department of Agriculture are said to have been written to. The hearing was postponed time and again. Finally, it was set for a definite date but before that time arrived it was again postponed. This, it must be remembered was in 1908. In the latter months of 1910, THE JOURNAL attempted to get some information regarding the status of the case. We were told that the case was still pending. It is now almost 1913 and so far as we can learn, the case is still pending! *Collier's*, in closing its article regarding this disgraceful piece of political activity says:

"Consider, now, one question: Was Perkins paid for what he did? Did he make that long hot trip from Rochester to Washington the night of July 16—Congress not being in session—from motives of public duty, or did he get money for it? If he

got money he is guilty of exactly the same crime as that for which Senator Burton of Kansas went to the penitentiary. For the immediate activity of the Secret Service men there is no more pressing need than the investigation of whatever checks may have passed during the last eight months from the Rochester manufacturers of Duffy's Malt Whiskey (Walter J. Duffy, president) to the Rochester law firm of Perkins, Duffy & McLean (this latter Duffy being J. P., son of Walter J.).

"But whether Congressman Perkins has been guilty of a crime is not the point of this article. What is important is to let all the people know how necessary is their constant vigilance and support to see that the Pure Food Law is carried out. If you were an obscure subordinate in the Department of Agriculture or the Department of Justice, if you had no motive to proceed against a swindling patent medicine or an adulterated food except your own conscience, if your first move met with personal protest from the congressman who controlled your salary, your promotion, and your official existence, how soon would you grow tired? The enforcement of the pure food law needs all the encouragement and enthusiasm that the public can contribute; there is no trouble about the enthusiasm of the opposition—that is a matter of dollars and cents, and it is working twenty-four hours a day."

"DUFFY'S ANNUAL"

Every bottle of Duffy's Malt Whiskey is wrapped in a large circular called "Duffy's Annual." This "Annual" consists, largely, of testimonials from laymen and physicians. We have on file one issued in 1901 and another issued in 1911. There are noticeable differences between the two circulars. In the earlier annual much is made of the statement that Duffy's Malt Whiskey contains no fusel oil; nothing is said on this point in the later circular. The 1901 issue comes out frankly with the falsehood that Duffy's Malt Whiskey "cures consumption," etc. In the 1911 circular the "lie direct" has given place to the "lie with circumstance." The earlier circular contains a long testimonial from Willard H. Morse and the Duffy company at the conclusion of the testimonial adds:

"Dr. Morse is not only an M.D. and an F.S.Sc., but is a well-known therapeutist and a consulting chemist of national reputation."

The facts are that Willard H. Morse is a professional testimonial writer who has issued fake analytical reports for some of the biggest frauds on the American market. The title "F.S.Sc." is one that is given—price $5 (1 guinea)—by a fraudulent organization in London that styles itself the Society of Science, Letters and Art. This title is very popular with "patent-medicine" fakers.

The earlier "Annual" recommends Duffy's dope for "painful and irregular periods"—pathologic states about which the later one says nothing. The 1911 circular "features" a testimonial from the "Hon. Richard Curran, M.D., formerly mayor of Rochester." This testimonial may carry weight with those who do not know that Dr. Richard Curran is in the employ of the Duffy's Malt Whiskey Co. He it was, as we have shown, who testified in May, 1905, that he prepared the various drugs which were put in Duffy's Malt Whiskey. But we have on file a letter written in 1910 by Dr. Curran—and written on the stationery of the Duffy Malt Whiskey Company—in which he declares:

"Duffy's Pure Malt Whiskey is not a patent medicine, but a refined medicinal whiskey, made from choice materials and complies with the test requirements of the United States Pharmacopeia."

Does this mean that the Duffy product of to-day is different from that sold five or six years ago? It would seem so. Some of the more recent pamphlets sent out by the Duffy Malt Whiskey Company contain what purport to be analyses made by chemists. One of these is from Joseph De Guehuee who, it will be remembered, when testifying in 1905 as chief chemist of the health department of the city of New York, declared that he found this product to be "whiskey with a little cane sugar added to it." But Dr. De Guehuee later became associated with the Lederle Laboratories and in that capacity he declared: "Duffy's Pure Malt Whiskey is free from added sugar . . ."

We have been asked at various times whether the testimonials of Duffy's Malt Whiskey purporting to come from physicians are genuine. Investigation of a large number of them indicates that the testimonials as now published are documentarily genuine. Evidently the Duffy Company has found that it is no longer necessary to "fake" testimonials,[1] as it has done in the past.

Of 104 physicians who had written testimonials for Duffy's Malt Whiskey, 5 are members of the American Medical Association, and 18 have written testimonials for other nostrums. From our files it appears that some of the 104 testimonial-givers are either advertising quacks or are connected with fraudulent medical concerns. It is not difficult to estimate the scientific value of testimonials that come from such sources.

CONCLUSION

We may accept the statement of the state chemists of North Dakota that the stuff is plain alcohol with syrup added to give it "smoothness" and coloring added to make it look like whiskey; or we may believe the federal chemist who declared it simply "whiskey of a very poor quality;" or we may think that Chemist De Guehuee was right when he said it was "whiskey, with a little cane sugar added to it;" or we may prefer Dr. De Guehuee's later pronouncement that the stuff "is free from added sugar;" again we may feel that Dr. Curran's early declaration is worthy of attention and that Duffy's Malt Whiskey contains drugs and is "a medicine" or possibly we may take Dr. Curran's later statement that the product is merely a whiskey as defined by the Pharmacopeia. But whether we consider Duffy's Malt Whiskey a "patent medicine" or a low grade "booze" makes little difference. On one point we can agree unanimously; the stuff is an impudent fraud. As we have said elsewhere: A high grade whiskey has but a limited place in therapeutics; Duffy's Malt Whiskey has none.

ADVERTISING FAKES

This from the Pulaski County *Democrat* of Winamac, Ind., November 14, is commented on editorially this week:

"The *Democrat* received a few days ago a proposition to publish considerable advertising matter boosting a 'patent medicine' called 'Nature's Creation,' which is asserted in the strongest language to be a cure for consumption. The offer meant quite a sum of money to us, but we refused to have anything to do with it.

"The reason for our action is that we do not knowingly advertise any article that is a fake, and we have what we believe to be reliable and authentic information that this pretended cure is a fake, a fraud, and that it will *not* cure consumption; therefore were we to advertise the stuff to do what it cannot, and thereby induce ailing persons to depend on a worthless nostrum until death resulted, our own skirts could not be clean morally.

"Our information is that this 'Nature's Creation,' now emanating from Columbus or Indianapolis, or both, was exploited in Chicago not very long ago as an 'absolute cure' for syphilis; but as the public became more and more interested in the subject of tuberculosis during the last four or five years the stuff has been changed to a consumption specific—probably more sale for it thus than for syphilis.

"We have a list of forty-five Columbus, Ohio, persons who are alleged to have taken this 'cure for consumption'—and died; we have not heard of any cured by it. It might be the proper thing if suicide is the object."

Correspondence

Dr. Robert Fletcher: An Appreciation

To the Editor:—With the death of Dr. Robert Fletcher, principal assistant librarian of the Surgeon-General's Library for nearly thirty-five years, there passed away a nestor of medicine who was looked up to and honored everywhere for his intensive labors in medical bibliography, his rare scholarship and that courteous and cheerful spirit of helpfulness which, in the words of Dr. Howard Kelly, "has endeared him to the entire profession of the United States." Almost 90

1. Some testimonials investigated a few years ago by THE JOURNAL were shown to be fraudulent. See THE JOURNAL A. M. A., Dec. 16, 1909, p. 1890.

when he died, his span of life, like Heberden's, extended over nearly a century, and with Heberden the scholar, as distinguished from the clinician, he had many points of resemblance. In his lifetime, he had seen and met personalities so various and so widely separated in time as Sir Astley Cooper and Halsted, Daniel Drake and Sir William Osler, Emerson and the philosophers and poets of a later period. A native of England, he had served his adopted country for fifteen years with distinction as an army surgeon during the Civil War and afterward, and he was buried at Arlington with the honors commensurate with the military rank he attained.

Dr. Fletcher was born in Bristol, England, on March 6, 1823. He studied law under his father, a Bristol attorney, for two years before taking up medicine. He spent five years at the Bristol Medical College and the London Hospital, being, at the time of his death, the oldest living graduate of the latter institution. He became a member of the Royal College of Surgeons and the Society of Apothecaries in 1844. In his youth, Dr. Fletcher was attracted by American institutions, and, crossing the ocean with his young wife, settled in Cincinnati in 1847. During the Civil War, we find him surgeon of the First Regiment of Ohio Volunteers in 1861, and after three years active service in the field, commissioned as surgeon, U. S. Volunteers, in charge of Hospital No. 7 at Nashville, Tenn., and subsequently medical purveyor of the Army at the same post. At the end of the war, he was brevetted lieutenant-colonel and colonel, U. S. Volunteers, for his faithful and meritorious services. In 1871, he was on duty in the Provost-Marshal's bureau of the War Department active in the preparation of the two volumes of anthropometric statistics issued by that office (1875) and the author of the treatise on anthropometry in the same work. In 1876, he became associated with Dr. John S. Billings in the Library of the Surgeon-General's office, and his important labors on its index-catalogue extended from the date of publication of its first volume in 1880 to the last year of his life, a period of thirty-three years. Of the value of this phase of Dr. Fletcher's work, it is only necessary to quote the judgment of Dr. Billings himself that "the accuracy and typographical excellence of the volumes are largely due to his careful and skilful supervision." The same painstaking care in preparation and proof-reading are evidenced in the *Index Medicus*, in the redaction of which Dr. Billings and Dr. Fletcher were associated as editors for twenty-one years (1879-99) and of which Dr. Fletcher was editor-in-chief for nine years, after the journal was revived by the Carnegie Institution in 1903. From his early studies in law, Dr. Fletcher acquired a deep interest in medical jurisprudence and was lecturer on this subject at the Columbian University, Washington, D. C., 1884-1888, and at the Johns Hopkins University, 1897-1903. He was president of various scientific societies in Washington and the recipient of many honors, most prominent of which were the banquet given to him by leading members of the profession on Jan. 11, 1906, and the unique award of the gold medal of the Royal College of Surgeons in 1910, a distinction which had been conferred on only eleven physicians in ninety years, most prominent of whom were Parkinson (1822), Thomas Bevill Peacock (1876), Richard Owen (1883), Sir W. J. Erasmus Wilson (1884), Sir James Paget (1897) and Lord Lister (1897). Only a few days before his death Dr. Fletcher was pleased to receive a degree in medicine from the institution which he had first attended in his native town. A severe attack of diphtheria in the spring of 1911 brought on a condition of enfeebled health which he bravely weathered but to which he gradually succumbed, dying on the morning of Nov. 8, 1912.

In personality, Dr. Fletcher was a dignified, stately gentleman of the old school, much admired and respected by old and young alike for his cheerful stoicism and military promptitude, his ready wit and courtly ways, and his literary productions were the expression of his personality. These are doubly attractive through the simple and direct manner in which the results of exhaustive research are conveyed and a certain strain of grave irony in which, as we have said, he resembles Heberden. His earlier essays were entirely in the field of anthropology and include, besides the statistical and anthropometric treatise above referred to, the pioneer monograph in English on "Prehistoric Trephining and Cranial Amulets" (1882); with interesting contributions on Paul Broca (1882), "Human Proportion in Art and Anthropometry" (1883), "Tattooing Among Civilized Peoples" (1883), "Myths of the Robin Redbreast in Earlier English Poetry" (1889), "The New School of Criminal Anthropology" (1891), "Anatomy and Art" (1895), and "Scopelism" (1897), the latter being also the first paper on the subject in English. A short paper on "Columns of Infamy" will soon appear in the American Anthropologist (No. 4, 1912). Dr. Fletcher's affiliations with the Medical Faculty of the Johns Hopkins University led to the production of a number of valuable papers on medical history, of which the best were his essays on "Medical Lore in the Older English Dramatists and Poets" (1895), "The Witches' Pharmacopeia" (1896), and "A Tragedy of the Great Plague at Milan in 1630" (1898). The former of these reveal his unusual offhand knowledge of English poetry; the latter is a remarkable piece of synthetic work, the story having been developed *ab initio* from a rare old Italian engraving. An unpublished essay on "Some Diseases Bearing the Names of Saints" will shortly appear in the *Bristol Medico-Chirurgical Journal*.

The profession will lose in Dr. Fletcher the accomplished bibliographer and medical scholar; his intimates will miss the high-minded, honorable gentleman, the staunch and loyal friend.

FIELDING H. GARRISON, M.D., Washington, D. C.

The New Hospital at Louisville

To the Editor:—I have just returned to Louisville after an absence of ten months spent on the Pacific Coast, and find many changes here in things medical. Chief among them is the creation of a million-dollar city hospital. I once heard it remarked that to judge any place correctly "one should look at the advantage of its public schools and the conditions of its cemetery." These may be good criteria, but I would add, "inspect the hospital intended for the treatment of the poor." Indeed, throughout Europe and this country as well, no greater problem confronts the medical profession than the proper management of these institutions.

You will permit, I am sure, some detailed mention of the superb building that is now nearing completion in this city. It may be that the erection of a similar institution is being contemplated elsewhere, in which case those who have charge of the matter may profit by reading this, or what would be better, may accept the invitation to come here and inspect the new building before completing their plans.

The hospital occupies a lot 727½ by 342 feet, located nearly in the center of the city. This is much to be preferred to a location in the suburbs, owing to the greater ease with which the patient may reach the hospital. The plans are on what might be termed a combination of the pavilion and cottage systems. The hospital consists of a central administration building, and four ward buildings, arranged symmetrically along a south connecting corridor, while the service, clinic and operating building and the psychopathic and special treatment building are on the north side of the corridor. Detached from the main group of buildings are the isolation buildings, help building, nurses' home and power plant. The buildings are generally of three stories with a high basement. The ward buildings have flat roofs with parapet walls, so that they may be used as roof-gardens for recreation and outdoor treatments. They have elevator service direct to the roof and will prove a valuable adjunct in the modern treatment of disease. All the buildings are constructed of concrete, reinforced by steel, and are believed to be fire-proof. There are no bells used, but all signals are given by electric lights communicating directly with the patient's bed. Each floor is a separate unit as far as unguarded intercommunication, transmission of noises and cross-infection are concerned.

The stairs throughout are monolithic, of reinforced concrete faced with terrazzo, are absolutely aseptic and are easily cleaned. The roof of the administration building has a semi-enclosed roof-garden, to be used as an outdoor ward for chil-

dren, so that they may have recreation without disturbing the other patients. It is roofed over and can be open or closed as desired.

One entire floor is taken up by operating-rooms and their adjuncts. All specialties have their recognition in a separate and distinct operating-room. Amphitheaters have been dispensed with for obvious reasons, excepting that for medical teaching one is provided with a seating capacity of 450; clinical instruction will be given in small rooms provided with skeleton iron stands.

The maternity wards are subdivided, with a ward for waiting women, two rooms for babies, a room for post-delivery cases and one for convalescents, with special accommodations for patients who may be infected.

The hospital is provided with psychopathic wards, so that suspected persons may be restrained and treated without first being declared insane by a jury.

I desire to call special attention to the fact that one of the most important departments in this hospital is that of nursing, and a special nurses' home has been provided. This is the more important, as the training-school is maintained here. It is a maxim that has been proved true, that the better a hospital cares for its nurses, the better will be the class of women who enter the training-school. Each nurse is provided with a separate room, plainly, neatly and tastefully furnished, each with clothes closet, lavatory with hot and cold water, a small combined desk and a wall bookcase. A small infirmary is built for those who may be ill. Special rooms afford opportunities for nurses to entertain their friends, and small kitchens have been built where nurses may prepare little treats for themselves or their friends.

It would take pages to describe in detail this splendid hospital, but I will make this suffice. I believe that it is the most modern and up-to-date hospital in the United States. It was erected under the supervision of a non-partisan commission on which was a physician, Dr. Ap Morgan Vance. Without disparagement to any one of the other distinguished and honored members of the commission, it can truthfully be said that much of the success in this great enterprise is due to Dr. Vance, who has been untiring in his work. Together with the others, Louisville owes him a deep debt of gratitude, and the medical profession here is proud of him and his work as evidenced in the result.

JOSEPH M. MATHEWS, Louisville, Ky.

Queries and Minor Notes

ANONYMOUS COMMUNICATIONS will not be noticed. Every letter must contain the writer's name and address, but these will be omitted, on request.

AVOIDANCE OF NERVOUS SHOCK IN ANESTHESIA

To the Editor:—1. Some time ago I saw in a lay paper the statement that from Paris had come a feature in surgical procedures that would rob operations of all their horrors: the hypodermic (or intramuscular?) injection of ethyl chlorid a day or two before operation to paralyze the fear-center in the brain. Please send me some details or refer me to some articles regarding it. That, with persistence of local anesthesia for days after injection of urea hydrochlorid and quinin, would be very desirable.

2. Please tell me how reliable the Noguchi modification of the Wassermann test is. J. F. R.

ANSWER.—1. The newspaper report referred to by our correspondent is probably the result of a play of popular fancy on a meager scientific basis. In our Paris Letter (THE JOURNAL, May 25, 1912, p. 1612), intramuscular etherization is mentioned. Dr. Descarpentries occasionally used an inhalation of ethyl chlorid preliminary to the intramuscular injection of the ether. This method of intramuscular etherization has been condemned by a number of Paris physicians, as will be seen in THE JOURNAL of July 27, 1912, p. 288. Considering the extreme volatility of ethyl chlorid, one would hesitate to use it by hypodermic injection.

The aim of the procedure suggested seems to be the same as that of Crile's "principle of anoci-association." According to this, the effort is made to plan and carry out operations so as to prevent the formation of harmful associations and the discharge of nervous energy leading to exhaustion. This is done by avoidance of everything that may tend to cause the patient preliminary worry or fear, and by cutting off the brain from the operative area by local anesthesia in addition to general anesthesia during operation, and by local anesthesia alone for a considerable period after operation. See Crile: The Results of Operations, Especially Abdominal, Performed on the Principle of Anoci-Association, THE JOURNAL, July 13, 1912, p. 114. Watson's modification of Crile's procedure (*Med. Rec.*, Oct. 5, 1912, p. 617) is to put the patient under local anesthesia before beginning general anesthesia and to begin and finish the operation under local anesthesia alone.

2. Many observers believe that the Noguchi modification is as reliable as the original Wassermann method, and others consider it more reliable.

QUALIFICATIONS FOR PRACTICE IN WEST VIRGINIA

To the Editor:—Can an unregistered physician legally practice medicine in West Virginia as the hired assistant of a qualified and registered practitioner? In answering, please omit my name. H. J. N.

ANSWER.—No person can practice medicine legally in West Virginia unless he holds a certificate issued by the State Board of Health. Section 4386 of Chapter 150 of the Code of West Virginia is as follows: "The following persons and no others shall hereafter be permitted to practice medicine in this state: 1. All such persons as shall be legally entitled to practice medicine in this state at the time of the passage of this act. 2. All such persons as shall be graduates of a reputable medical college, recognized as such by the State Board of Health, who shall pass an examination before said State Board of Health and shall receive certificates therefrom, as hereinafter provided."

THYMUS SUBSTANCE IN ARTHRITIS DEFORMANS

To the Editor:—Please refer me to any articles on the treatment of arthritis deformans with thymus gland. I read an article on the subject which appeared in THE JOURNAL, but am unable to find it again. C. T. PANKHURST, North Star, Mich.

ANSWER.—References to articles on the treatment of arthritis deformans with thymus substance were given in this department, Sept. 28, 1912, p. 1205.

FINLAY'S MOSQUITO THEORY OF THE TRANSMISSION OF YELLOW FEVER

To the Editor:—In your interesting answer (November 9, page 1733) to the question of Dr. F. J. McKinley concerning the relation of the mosquito to disease, you make no mention of Dr. Finlay of Havana, for whom some claim priority in the suggestion that the spread of yellow fever is due to the mosquito. I am sure that it will interest many of your readers to have the facts of this relation presented. JAMES TYSON, Philadelphia.

ANSWER.—To Dr. Carlos J. Finlay of Havana is generally awarded the credit for first explicitly pointing out the connection between the carrier and the disease. In 1881 Finlay advanced the theory of the conveyance of yellow fever by the bite of the mosquito and correctly distinguished the species of mosquito (*Stegomyia calopus*) which, as later proved by the experiments of the American Yellow Fever Commission, transmits the disease to man. He had not at that time the advantage derived by later investigators from knowledge of the rôle played by the mosquito in malarial fever and believed yellow fever to be conveyed from one patient to another by direct inoculation of a virus. While his experiments undertaken to prove the theory were uniformly unsuccessful, this detracts nothing from the value of the inductive reasoning by which he reached his conclusions. The dramatic interest attaching to the heroic work of the U. S. Army Yellow Fever Commission has tended to overshadow Dr. Finlay's work somewhat in popular estimation; but members of the commission in their published writings have acknowledged that they were working on the foundation supplied by Dr. Finlay's theory. No discovery in early literature of any casual hint or chance hypothesis as to the relation of mosquitoes to yellow fever will disturb Finlay's claim to credit as the man who for twenty years pertinaciously defended the theory single-handed in the face of an indifferent if not hostile public; but in this instance, as in many others, it is interesting to see how correct theories and suggestive observations remained sterile only because those who conceived the theories or made the observations failed to appreciate their value or perhaps lacked the patience, time or opportunity to follow them up. We felt that it was inappropriate to associate with such obscure and shadowy

claims to recognition as those discussed November 9 the solid and undisputed facts as to Finlay's connection with the subject. Perhaps this was a mistake; at all events the neglect to mention Finlay was not prompted by a desire to depreciate his achievement.

IS LIGHT FATAL TO PLASMODIA?

To the Editor:—In THE JOURNAL, October 12, p. 1381, you write on "Cultivation of Malarial Plasmodia" and refer to an action of quinin.

The rediscovery of the filaria by observers in Egypt following its discovery by ————? was put off by the neglect to examine the patients after sunset, the parasite coming to the surface of the body in the dark. Negroes, native to Africa, become immune to malaria (and filariasis) by having skins impervious to light. The three substances causing death of the plasmodia are all substances which have the power of causing fluorescence. They are quinin, esculin and fraxinin.

Is it not likely, from these facts, that light or actinism is fatal to plasmodia and that exposure of patients to sunlight after introducing one of the above-named fluorescent substances would hasten recovery? EDMUND D. SPEAR, M.D., Boston.

ANSWER.—The theory that the action of quinin on malarial parasites is connected with its property of fluorescence was advanced a number of years ago. While it is a curious circumstance that the substances enumerated by our correspondent are fluorescent, we do not think that the theory that fluorescence is necessary to a pharmacologic action is rational.

It is a remarkable fact that quinin exhibits fluorescence only when the haloid acids or salts are not present. Such salts as chlorids, bromids or iodids added to a fluorescent solution of quinin prevent the occurrence of fluorescence. Since the blood contains chlorids in a considerable quantity, it is not reasonable to expect the fluorescence of quinin to be exhibited in such a medium, and hence it would seem improbable that this property could affect the action of the remedy on the plasmodia. Moreover, certain cinchona alkaloids, such as cinchonin or cinchonidin are not fluorescent, but have a positive action on malaria.

NO SODIUM SALICYLATE HYPODERMIC TABLETS—NO ARTIFICIAL QUININ

To the Editor:—1. Why are not hypodermic tablets of sodium salicylate or any other salicylate preparation on the market for hypodermic use?

2. Is the quinin in common use natural or artificial, and, if the latter, does it possess the same antimalarial virtue as that derived from natural sources? RALPH S. CONE, M.D., Westwood, N. J.

ANSWER.—1. Sodium salicylate is not used for hypodermic injection because the dose is large, and, unless much diluted, would be likely to cause irritation. Usually this substance can be given by the mouth without inconvenience, and it has been proposed, in cases in which the stomach is rebellious, to administer it by rectal injection. We do not know that any proposal has been made to administer it hypodermically. It is not put up in the form of hypodermic tablets by the pharmaceutical houses, because there is no demand.

2. So far as we know, no artificial quinin has been put on the market. The quinin in commerce is obtained from the compounds of quinin existing in cinchona bark.

OINTMENT FOR CARCINOMA OF THE SKIN; TREATMENT FOR ALCOHOLISM

To the Editor:—1. Please publish the formulas of the ointment used to remove moles and carcinoma of the skin that you published several months ago. It was similar to the remedy Squibb & Sons sold.

2. Also refer to the page that contained the treatment for alcoholic patients. ROSS C. MARTIN, M.D., Kokomo, Ind.

ANSWER.—1. The ointment to which our correspondent refers is probably the proprietary Thoremedin, formerly called Thoradin, of which we published an analysis, March 9, 1912, p. 719.

2. The article entitled "The Treatment of Drug Addiction," by A. Lambert, was published in THE JOURNAL, Feb. 18, 1911, p. 503.

CONTINUED USE OF SODA IN HYPERCHLORHYDRIA

To the Editor:—Please answer the following in your Queries and Minor Notes Department., and do not publish my name: Can the continued use of sodium bicarbonate in 30-grain doses taken after each meal, say for a term of years, for hyperchlorhydria, do any harm? Could it be a possible factor in producing general pruritus? M. T. R.

ANSWER.—The dose mentioned will barely neutralize the acid in 500 c.c. of normal gastric juice. In case of hyperacidity it would not completely neutralize the acid. In case the alkali is completely neutralized by the acid in the gastric juice, as would probably be the case in presence of hyperacidity, sodium chlorid would be formed, so that the use of the sodium bicarbonate would be practically equivalent to the administration of a small dose of about 20 grains of sodium chlorid. Of course, it is not advisable to continue a single remedy for so long a time, and certainly it would be desirable to make frequent examinations of the stomach contents to determine that the hyperchlorhydria continues. The effect of the continued neutralization of the stomach contents might be to cause a frequent or continual alkalinity of the urine, which might have undesirable results. In general, however, the use of alkalies in hyperchlorhydria is productive of good and not harm.

BISMUTH PASTE

To the Editor:—Please publish formulas for bismuth paste as used by Beck and others. J. M. F.

ANSWER.—The following were recommended by Beck in his original article in THE JOURNAL, March 14, 1908, p. 868:

Formula of paste for diagnosis and early treatment:

℞

Bismuth subnitrate	1 part
Petrolatum	2 parts

Mix while boiling.

Formula of paste for late treatment:

℞

	gm.	
Bismuth subnitrate	30	℥ss
White wax		
Soft paraffin	āā 5	āā, gr. 75
Petrolatum	60	℥ii

Mix while boiling.

Another formula was given in Dr. McKelvey Bell's article, THE JOURNAL, May 4, 1912, p. 1340:

℞

Bismuth subnitrate	1 part
White petrolatum	2 parts

Dissolve on hot water-bath, stirring until cool; then (still stirring) add 5 per cent. of iodoform (i. e., 72 gr.).

OXYPÂTHOR

To the Editor:—Can you give me any literature on the Oxypathor? There is a woman pushing it in Harrisburg. She has a sign on her door and travels from house to house trying to sell it for $35. One is on exhibition in a book-store window. It is a fake. They have sold a number, claiming that it cures all diseases. DAVID J. HETRICK, M.D., Harrisburg, Pa.

ANSWER.—Our correspondent is right. The Oxypathor is a fake and one of the most impudent on the market. It used to be sold under the name "Oxygenator" and as such has been debarred by the Australian government from importation into that country; also, its sale was prohibited some time ago in the state of Vermont. The device is essentially a nickel-plated piece of gas-pipe filled with a crude mixture of inert substances, apparently iron-filings, clay and coke dust. This fraud is exposed at some length in a pamphlet issued by the American Medical Association entitled: "The Oxydonor and Similar Fakes," which will be sent on receipt of four cents in stamps. The same matter appears in the book "Nostrums and Quackery," price one dollar.

LITERATURE ON POSTGRADUATE WORK ABROAD

To the Editor:—Have you any bureau of information or literature which will give me valuable and necessary information for reaching and profiting by a course of study in the medical schools of Europe, particularly the schools in Berlin?

E. HORNIBROOK, M.D., Cherokee, Iowa.

ANSWER.—Our correspondent and a number of others who have made similar inquiries are referred to this department of THE JOURNAL, Oct. 5, 1912, p. 1310, Oct 19, 1912, p. 1474, and April 8, 1911, p. 1056. The last reference is to a long article describing the facilities of the chief medical centers of Europe in detail.

SEXUAL DESIRE AFTER CASTRATION AFTER PUBERTY

To the Editor:—Please inform me if castration after puberty completely or only partially destroys the sexual desire; and also, if a double oophorectomy completely destroys or only partially inhibits the sexual desire in the female. P. T. R.

ANSWER.—It is usually believed that castration after puberty may permit the retention of a certain amount of sexual desire. This is certainly true in the case of double oophorectomy. In the latter case some women lose their sexual feeling, while others retain it apparently unimpaired.

CONVERSE TREATMENT FOR EPILEPSY

To the Editor:—Please tell me the composition of the Converse Treatment for Epilepsy. S. P. L.

ANSWER.—Practically every nostrum on the market sold for the self-treatment of epilepsy contains large quantities of bromids. These are taken by the patient in utter ignorance of the danger and in quantities that no physician with any respect for his patient's safety or his own good name would dare prescribe. Such heavy doses suppress the attacks but brutalize the patient and lead to a loss of mental and physical activity. The Converse Treatment for Epilepsy was analyzed by Prof. E. F. Ladd of the North Dakota Agricultural Experiment Station. Professor Ladd reported that the sample was an aqueous solution of several bromids with an aromatic galenical preparation, and that it contained:

Ammonium bromid	4.28 per cent.
Total bromin	10.396 per cent.

Professor Ladd added: "The total bromin calculated as the equivalent of potassium bromid would equal 15.486 per cent. But not all of the bromin is in combination with the potassium, for there are present in the preparation sodium bromid, potassium bromid, strontium bromid, ammonium bromid and iron bromid."

Medical Education and State Boards of Registration

COMING EXAMINATIONS

CALIFORNIA: Los Angeles, December 3-6. Sec., Dr. Charles L. Tisdale, 929 Butler Bldg., San Francisco.

DELAWARE: State Society and Homeopathic Examining Boards, Dover and Wilmington, December 10-12. Secretary of the Medical Council, Dr. Henry W. Briggs, 1026 Jackson St., Wilmington.

KENTUCKY: The Armory, Louisville, December 12. Sec., Dr. J. N. McCormack, Bowling Green.

MARYLAND: Regular, 1211 Cathedral St., Baltimore, December 10. Sec., Dr. J. McPherson Scott, Hagerstown; Homeopathic, St. Luke's Hospital, Baltimore, December 13-14. Sec., Dr. O. N. Duvall, 1326 N. Mount Street.

OHIO: Columbus, December 10-12. Sec., Dr. George H. Matson, State House.

PENNSYLVANIA: Philadelphia, December 3-5. Sec., Nathan C. Schaeffer, Harrisburg.

VIRGINIA: Richmond, December 17-20. Sec., Dr. Herbert Old, Norfolk.

Affiliation of Hospital with Medical School

The announcement has recently been made of an affiliation between the New York Hospital and the Medical Department of Cornell University in New York City. The terms of the copartnership are that in consideration of a substantial fund donated to the hospital to aid its future building projects, the institution gives to the medical college for purposes of teaching and research, one-half of its entire service, comprising medical, surgical and children's wards, in all about 150 beds. The exact amount of the gift has not been made public, but the donor, Mr. George F. Baker, is a member of the board of governors of the New York Hospital and is said to be deeply interested in medical education. He thus evinces his conviction that the greatest efficiency for both hospital and medical school is to be attained through coalition. This coalition is fully in accord with the principles long advocated by the Council on Medical Education of the American Medical Association. Already throughout the country fully a dozen coalitions between university medical schools and neighboring hospitals have been brought about. Each coalition strengthens the cause of higher medical education by increasing the opportunities of colleges in both undergraduate and graduate instruction, and by supplying them with the definite field for advanced research without which such work must always be restricted. The further announcement is made of the gift to the medical college by another philanthropist of a $1,000 annual fellowship in medicine to be allotted for work in the New York Hospital medical wards. The college, besides large building properties and equipment, now possesses an endowment for maintenance of $4,000,000, which places it among the highest-endowed medical schools in the country.

Georgia October Report

Dr. C. T. Nolan, secretary of the Regular Medical Examining Board of the State of Georgia, reports the written examination held at Atlanta, Oct. 8-10, 1912. The number of subjects examined in was 10; total number of questions asked, 100; percentage required to pass, 80. The total number of candidates examined was 30, of whom 20 passed and 10 failed. The following colleges were represented:

PASSED

College	Year Grad.	Per Cent.
Birmingham Medical College.....	(1911) 85.5; (1912)	80, 80
Howard University, Washington, D. C.....	(1912)	87.5
Atlanta School of Medicine.....	(1912)	81.5, 85.5
University of Louisville.....	(1912)	85.5
Tulane University of Louisiana.....	(1912)	89.5
University of Maryland.....	(1912)	85.5
Maryland Medical College.....	(1911) 81; (1912)	85
College of Physicians and Surgeons, Boston.....	(1911)	86.5
St. Louis University.....	(1912)	84
North Carolina Medical College.....	(1912)	85
Leonard Medical School.....	(1912)	83.5
Medico-Chirurgical College of Philadelphia.....	(1906)	80
Med. Coll. of State of South Carolina.	(1901) 84.5; (1912)	82
Chattanooga Medical College.....	(1908)	81
Westminster Hospital, London, England.....	(1897)	81

FAILED

University of Louisville.....	(1912) 77.5
Maryland Medical College.....	(1911) 77
University of the South.....	(1905) 67.5
Meharry Medical College (1908) 77.5; (1912) 74, 75.5, 76, 77.5, 78, 78.5.	

Georgia Reciprocity Report

Dr. C. T. Nolan, secretary of the Regular Medical Examining Board of the State of Georgia, reports that twenty-three candidates were licensed by that Board through reciprocity from June 1 to Oct. 29, 1912. The following colleges were represented:

LICENSED THROUGH RECIPROCITY

College	Year Grad.	Reciprocity with
Medical College of Alabama.....	(1894)	Florida
Northwestern University Medical School.....	(1911)	Iowa
Sioux City College of Medicine.....	(1897)	Nebraska
University of Louisville.....	(1909)	N. Carolina
Hospital College of Medicine, Louisville.....	(1897)	Kansas
Tulane University of Louisiana.....	(1910, 2)	Louisiana
Baltimore Medical College.....	(1903)	Maryland
College of Physicians and Surgeons, Baltimore...	(1882)	Virginia
Johns Hopkins University.....	(1903)	Wisconsin
University of Michigan, Dept. of Med. and Surg..	(1912)	Michigan
Washington University, St. Louis.....	(1897)	Missouri
Barnes Medical College.....	(1903)	Missouri
Columbia University, College of Phys. and Surg.	(1901)	Dist. Colum.
North Carolina Medical College.....	(1907)	N. Carolina
Tennessee Medical College.....	(1896)	N. Carolina
University of West Tennessee.....	(1909)	Tennessee
Vanderbilt University.....	(1899) (1908)	Tennessee
University of Tennessee.....	(1891) (1901)	Tennessee
Memphis Hospital Medical College.....	(1910)	Tennessee
University of the South.....	(1908)	Tennessee

Minnesota October Report

Dr. Thomas S. McDavitt, secretary of the Minnesota State Board of Medical Examiners, reports the written examination held at Minneapolis, Oct. 1-4, 1912. The number of subjects examined in was 18; total number of questions asked, 110; percentage required to pass, 75. The total number of candidates examined was 6, of whom 4 passed and 2 failed. Eighteen candidates were licensed through reciprocity. The following colleges were represented:

PASSED

College	Year Grad.	Per Cent.
Johns Hopkins University.....	(1910)	88
Univ. of Mich., Dept. of Med. and Surg.....	(1894)	80
Barnes Medical College.....	(1905)	80
University of Pennsylvania.....	(1911)	85

FAILED

University of Louisville.....	(1911)	62
Hamline University	(1908)	71

LICENSED THROUGH RECIPROCITY

College	Year Grad.	Reciprocity with
Northwestern Univ. Med. Schcol....	(1910, 3) (1911, 1)	Illinois
Rush Medical College (1898) North Dakota; (1911) Missouri; (1911, 2) Illinois.	(1898)	Wisconsin;
Bennett Medical College.....	(1912)	Illinois
Hahnemann Med. Coll. and Hosp., Chicago.....	(1910)	Illinois
State University of Iowa, Coll. of Med.....	(1908)	Iowa
University of Louisville.....	(1911)	Kentucky
Baltimore Medical College.....	(1898)	N. Dakota
Univ. of Mich., Dept. of Med. and Surg.....	(1905)	Michigan
Milwaukee Medical College.....	(1911, 2) (1912)	Wisconsin

Montana October Report

Dr. William C. Riddell, secretary of the Montana State Board of Medical Examiners, reports the written examination held at Helena, Oct. 1-3, 1912. The number of subjects examined in was 10; total number of questions asked, 50; percentage required to pass, 75. The total number of candidates examined was 29, of whom 25 passed and 4 failed. The following colleges were represented:

PASSED College	Year Grad.	Per Cent.
Bennett Medical College	(1900)	78.2
Hahnemann Medical College and Hospital, Chicago	(1900) (1912) 75.	78;
Chicago Coll. of Med. and Surg.	(1911) 78.4; (1912)	84.3
College of Physicians and Surgeons, Chicago	(1910)	79.9
Rush Medical College	(1905) 78.4; (1911)	80
Medical College of Indiana	(1905)	77.9
Keokuk Medical College	(1907) 76.9; (1908)	76.7
Baltimore Medical College	(1898) 80.7; (1903)	77.1
University of Michigan, Dept. of Med. and Surg.	(1912) 82.1,	83.7
Detroit College of Medicine	(1906)	78.6
University of Minnesota, Coll. of Med. and Surg.	(1910)	79.8
Creighton Medical College	(1906) 77; (1912)	81.9
University Medical College, Kansas City	(1912)	83.4
Jefferson Medical College	(1912)	80.4
University of Pennsylvania	(1910)	84.6
University of Vermont	(1910)	76.7
Milwaukee Medical College	(1911) 80.8; (1912)	79.9

FAILED College	Year Grad.	Per Cent.
College of Physicians and Surgeons, Chicago	(1910)	69.6
Georgetown University	(1903)	69.4
Michigan College of Medicine and Surgery	(1901)	73
Vanderbilt University	(1912)	73.4

Rhode Island October Report

Dr. Gardner T. Swarts, secretary of the Rhode Island State Board of Health, reports the written examination held at Providence, Oct. 3-4, 1912. The number of subjects examined in was 7; total number of questions asked, 70; percentage required to pass, 80. The total number of candidates examined was 15, of whom 13 passed and 2 failed. The following colleges were represented:

PASSED College	Year Grad.	Per Cent.
College of Physicians and Surgeons, Baltimore	(1912)	83.5
Harvard Medical School	(1895) 85.7; (1910) 86.2; (1911)	88.2
Tufts College Medical School	(1903) 85.2; (1911) 82.3, (1912) 83.4, 86.5.	88;
University and Bellevue Hospital Medical College	(1910)	81.8
University of Pennsylvania	(1912)	89
Medico-Chirurgical College, Philadelphia	(1912)	81.4
Laval University, Quebec	(1911)	81.4

FAILED College	Year Grad.	Per Cent.
Baltimore Medical College	(1907)	68.9
Harvard Medical School	(1906)	76.2

Book Notices

LIFE AND LETTERS OF DR. WILLIAM BEAUMONT, INCLUDING HITHERTO UNPUBLISHED DATA CONCERNING THE CASE OF ALEXIS ST. MARTIN. By Jesse S. Myer, A.B., M.D., Associate in Medicine in Washington University, St. Louis. With an Introduction by Sir William Osler, Bt., M.D., F.R.S., Regius Professor of Medicine in Oxford University, England. Cloth. Price, $4. Pp. 317, with illustrations. St. Louis: C. V. Mosby Company, 1912.

William Beaumont, the first great American physiologist, was licensed to practice physic and surgery by the Third Medical Society of Vermont in 1812. He had then studied medicine for two years with Dr. Benjamin Chandler in St. Albans. One hundred years later, and fifty-nine years after his death in St. Louis, appears this complete story of his life and work. In the words of Sir William Osler, three generations have now been interested in the work of Beaumont as well as in "that fistulous Alexis" who was the, at times, elusive subject of his remarkable experiments. The chief facts of the life of Beaumont have become well known from the many addresses and sketches that have been printed about him and his work, but authentic sources for an adequate biography became available only recently when a wealth of family papers, records, manuscripts and letters were placed at the disposal of Dr. Myer, who has spared no pains in collating this vast material to the best advantage and in following every promising thread of information to its end. New England town records, the surgeon-general's office in Washington, various army posts, the scenes of Beaumont's activities, old newspapers and letters have been ransacked for information. Every page is a witness of labor of love on the part of Dr. Myer to give us a faithful picture of the great Beaumont in its proper setting so that we are able, "as it were, to see him alive." The illustrations and fac-simile reproductions of letters, documents and old newspaper notices are most interesting. Beaumont's letters and other writings reproduced unaltered in the various chapters serve to keep safe his individuality. The result is a book that it is a real pleasure to welcome; for it constitutes a contribution of the first importance not only to the history of medicine in America but to the history of physiology. It will take its place among the classics in medical biography and merits the widest distribution possible.

THE PITUITARY BODY AND ITS DISORDERS. Clinical States Produced by Disorders of the Hypophysis Cerebri. An Amplification of the Harvey Lecture for December, 1910. By Harvey Cushing, M.D., Associate Professor of Surgery, the Johns Hopkins University. Cloth. Price, $4. Pp. 341, with 319 illustrations. Philadelphia: J. B. Lippincott Company, 1912.

The anxiously expected monograph on the hypophysis has at last made its appearance. Those who have followed the author's labors in this new field expected an authoritative work from his pen. This monograph more than justifies expectations. The subject-matter is largely drawn from an enormous personal experience with the clinical and surgical affections resulting from hypophyseal disorders, supplemented by experiments on animals. The theoretical views advanced are in keeping with the latest thought. The case reports are well worth studying for their intrinsic merits; they are concise and yet complete and indicate the author's participation, rather than the transcribing of an ordinary hospital record. The text is profusely illustrated with excellent reproductions from photographs of patients, and the microphotographs and radiographic pictures are exceptionally fine. As this book is the outgrowth of the Harvey lecture for 1910, its style in places is quite literary in character, but if anything this is a merit rather than a fault in a monograph dealing with so many new facts. Every line mirrors the author, being peculiarly cushingian in its positiveness. In his systematic summary of the entire subject Cushing gives due credit to every worker in this new field and his bibliography includes 256 references. While many of the views expressed will undoubtedly need modification as soon as new experiences accumulate, at the present time this monograph reflects the most modern and mature thought on the hypophyseal disorders.

COLLECTED PAPERS BY THE STAFF OF ST. MARY'S HOSPITAL, MAYO CLINIC, ROCHESTER, MINN. 1911. Cloth. Price, $5.50 net. Pp. 603, with 250 illustrations. Philadelphia: W. B. Saunders Company, 1912.

This volume includes the papers of the Mayo Clinic for 1911 and naturally a large variety of subjects is considered. The greater part of the book is devoted to the alimentary canal and the genito-urinary organs. Ductless glands receive a comparatively small share of attention. Of special interest is the group of papers on diagnostic aids, including radiographic diagnosis and the use of the cystoscope. The paper by Dr. J. H. Selby, on "Collaboration in Radiographic Diagnosis," is profusely illustrated. The papers on the ductless glands are by Dr. Charles H. Mayo, with one on "Parathyroids and Their Surgical Relations to Goiter" by Drs. Charles H. Mayo and Bernard F. McGrath. The book closes with an obituary of William Worrell Mayo, the father of the Mayo brothers, who died March 6, 1911, at the age of 92.

LECTURES ON GENERAL ANESTHETICS IN DENTISTRY. Advocating Painless Dental Operations by the Use of Nitrous Oxid, Nitrous Oxid and Oxygen, Chloroform, Ether, Ethyl Chlorid and Somnoform. By William Harper DeFord, A.M., D.D.S., M.D., Dean and Professor of Oral Pathology and Anesthetics, Drake University College of Dentistry. Cloth. Price, $2.50. Pp. 312, with illustrations. Pittsburgh: Lee S. Smith & Son Company, 1912.

Many new appliances for the safe administration of anesthetics have been introduced to the profession during the past year. The second edition of this most valuable work is made necessary to bring the account of these later inventions up to date. The first chapter is devoted to the subject "Has the Dental Surgeon the Right to Administer General Anesthetics?"

After discussing the merits of general anesthetics the author concludes that the dentist has the right to administer them if he possesses the requisite knowledge, skill and experience. On the other hand, he has not the right to administer anesthetics unless he is familiar with their effects and can show his proficiency in this respect. The author then discusses the value of general anesthetics in dental operations. He shows the necessity of reducing pain to the minimum in the different operations, such as preparing cavities and extracting teeth. The subject of shock in preparing cavities of the teeth and a general discussion of anesthetics follow.

PATHOLOGIE DES HERZENS. Von A. Vogt, ö. Professor der allgemeinen Pathologie an der kaiserlichen Universität Moskau. Autorisierte Uebersetzung aus dem Russischen, von Dr. Julius Schutz. Paper. Price, 8 marks. Pp. 168, with 20 illustrations. Berlin: Julius Springer, 1912.

This monograph presents in clear, concise and readable form the essential facts of cardiac pathology, the subject being approached from the side of pathology rather than from that of the clinical manifestations, diagnosis or treatment. Cardiac diseases, as a rule, are clearly traced to anatomic lesions, and the proper emphasis is laid on the resulting disturbance of function. The subject is presented in the form of eight lectures. Facts are clearly distinguished from theory, animal experiment is often adduced in support of the views advanced, and a knowledge of the clinical manifestation of heart disease is evident. The author shows familiarity with the literature. There is a lack of discussion of some of the more recent work on the heart, which omission is frankly stated in the preface. An extensive bibliography is found at the end of the work.

THE PRACTITIONER'S VISITING-LIST FOR 1913. Leather. Price, $1.25. Pp. 192. Philadelphia: Lea & Febiger, 1912.

Among the useful data in this visiting-list are: periods of dentition, weights and measures, comparative scales, examination of the urine, important incompatibles, poisons and antidotes, table of doses and therapeutic reminders. The best hint given, however, is in the first line: "Keep your visiting-list in such a way that you can fully explain it." This sentence alone is worth the price of the book, because physicians are sometimes haled into court because of a dispute about the bill for services rendered, and at such a time an "explainable" visiting-list has often been the means of securing a decision in the doctor's favor. This book is of convenient size, well bound in red leather, and printed on good strong paper. Provision is made for keeping a record of visits, vaccinations, confinements, addresses and a cash account.

THE CHEERFULNESS OF DEATH. By W. W. Keen, M.D., LL.D. Paper. Price, $0.15. Philadelphia: The Griffith and Rowland Press, 1912.

This neat pamphlet contains, besides helpful extracts from Holmes, Tennyson and Newman, words of Christian encouragement concerning the crossing of the bar and the life beyond. It is well designed to minimize the apprehension which a patient may have on considering the approach of death.

Medicolegal

Operating Without Consent of Patient—Common-Law Rule Must Be Adapted to the Employment of Anesthesia in Surgical Operations—Surgeon is Patient's Representative

(Bennan vs. Parsonnet (N. J.), 83 Atl. R. 948)

The Supreme Court of New Jersey holds that a verdict for $1,000 damages for alleged malpractice cannot be permitted to stand, being against the clear weight of evidence. It says that the plaintiff applied to the defendant to operate on a rupture in his left groin that had been unsuccessfully operated on two years before by another surgeon. On learning that the plaintiff was a poor man, the defendant engaged to operate free of charge. At the time fixed for the operation the plaintiff was placed under the anesthetic by two assisting surgeons who, when the defendant came into the operating-room, directed his attention to a rupture they had just discovered in the patient's right groin, which, on examination and the employment of the usual diagnostic tests, was determined by the three surgeons to be a serious menace to the patient and likely to cause his death should strangulation occur, dangers not to be apprehended from the rupture that had once been operated on. The defendant thereupon operated on the more serious rupture, intending to operate also on the other, which he was prevented from doing by the patient's condition under the anesthetic. The patient on being informed that the operation would be completed on a following day, apparently acquiesced, but later declined to go on with the operation, and brought this action against the defendant for assault and battery.

The trial judge charged the jury that the operation was a legal wrong to the plaintiff, unless he had consented to its performance, explaining to them that such consent as to conditions discovered after the operation had actually commenced might be inferred from circumstances, and that it should be inferred if the condition thus discovered endangered the life or health of the patient, leaving to them the question whether the condition for which the defendant had operated was of that character. On the question thus submitted to the jury, the evidence was overwhelming against the verdict. The testimony of unimpeached medical witnesses that the rupture that was operated on was a serious menace to the health of the plaintiff, and even to his life, should it become strangulated, was not even attempted to be contradicted. On this point the testimony of the witnesses, who had personal knowledge of the facts, was corroborated by that of a witness who was shown to be a surgeon of great experience and a recognized authority in his profession. A verdict rendered in the face of this testimony could rest only on the assumption of superior knowledge by the jury. The duty of the jury was to render a verdict on the evidence, and that it did not do.

The verdict must, therefore, be set aside without regard to whether the question that was left to the jury was or was not the precise question that should have been submitted to them, although the court thinks that it was not. It is true that the judge in his charge laid down the common-law rule with substantial correctness, but it is also true that the introduction of anesthesia into the practice of surgery has modified the application of the common-law rule in certain fundamental respects of which the law must take notice. The trial judge in his charge followed the opinion of Judge Brown in Mohr vs. Williams, decided by the Supreme Court of Minnesota, 95 Minn. 261, which, as annotated in 1 L. R. A. (N. S.) 439, correctly presents the common-law rule on the subject. That rule is thus stated in 1 Kinkead on Torts, p. 395: "The patient must be the final arbiter as to whether he shall take his chances with the operation or take his chances of living without it. Such is the natural right of the individual which the law recognizes as a legal one. Consent, therefore, of an individual, must be either expressly or impliedly given before a surgeon may have the right to operate." In general justification of this common-law rule, Judge Brown says in his opinion: "There is logic in the principle thus stated, for in all other trades, professions, or occupations contracts are entered into by the mutual agreement of the interested parties, and are required to be performed in accordance with their letter and spirit. No reason occurs to us why the same rule should not apply between physician and patient."

Without stopping to point out the fallaciousness of the premise that a surgical operation can be contracted for or performed according to plans and specifications, it is enough to say that the entire foundation of the supposed analogy is swept away by the surgical employment of anesthesia, which renders the patient unable to consent at the very time that the rule of the common law required that his consent be obtained; for in those days the patient (such was the horror of it) was a conscious participant in such surgical operations as were then performed, and as his consent could be obtained the rule of the common law was that it must be obtained. The surgical employment of anesthesia has, as matter of common knowledge, not only eliminated the possibility of obtain-

ing the patient's consent during the operation, but has also had other radical effects of which notice must be taken. Thus it has rendered possible and of everyday occurrence surgical operations of a character and magnitude not dreamed of at the time the common law was in the making, and, as a matter of practical moment, has also advanced the period that marks the commencement of a surgical operation from the time when the patient's body is actually invaded by the knife to the time when the anesthetic is administered, or at least when the patient has succumbed to its influence. The employment of anesthesia has also postponed to this same period of relaxation and unconsciousness the making of that complete and final diagnosis of the patient's condition that at common law was made at a time when he could be both informed and consulted. By these considerations the scope of modern surgical operations has been greatly enlarged, and the legal rule applicable thereto extended beyond the emergencies of actual surgery to other matters more or less vitally affecting the patient's welfare. To meet these changed conditions, the rule of law must, in the interest alike of the patient and the surgeon, be adapted to the changes that have been so wrought, chief among which is the unconscious state of the patient at a time when by the common-law rule his consent must be obtained. To meet this fundamental change in the condition of the patient, it is imperative that the law shall in his interest raise up some one to act for him—in a word, to represent him in those matters affecting his welfare concerning which he cannot act for himself because of a condition that has become an essential part of the operation.

If such a representative has been chosen by the patient himself, the rule we are considering has no application, but, if no one has been so appointed, the law by its constructive power will raise up such a representative without which the welfare and even the life of the patient might be needlessly sacrificed. To meet the requirements of the case, such representative should not only keenly appreciate the nature of the duty that is thus cast on him, but also be possessed of the knowledge and skill to perform such duty with wisdom and promptness. He should also be one in whom the patient reposes confidence and on whose judgment he would presumably rely. The surgeon whom the patient himself has selected alone fills all of these requirements, and hence on him the law would cast the responsibilities of this office by the legal implication that the patient intended him to act for him when he had made no other selection.

This implication accords with those analogies of the common law by which prompt and timely aid to accidentally injured or unconscious persons is secured from those not expressly authorized to render it. And I (the court's opinion was prepared by Justice Garrison) have no doubt that, should such an accident occasion a depression of the skull that rendered the injured person unconscious, the consent of such person to the necessary surgical operation would be implied at common law, although I find no such reported case. A like analogy to some extent is found in the American decisions touching actions for compensation for services rendered to unconscious persons, a topic on which the English cases are silent owing to that hallucinatory honorarium on which the learned professions in Great Britain are supposed to rely for their subsistence. At bottom these analogies all rest on the maxim that one is presumed to accept that which is beneficial to him, a doctrine that, if applied to commerce and the transfer of property, should surely be applied where life and health are at stake.

The conclusion, therefore, to which the court is led is that when a person has selected a surgeon to operate on him, and has appointed no other person to represent him during the period of unconsciousness that constitutes a part of such operation, the law will by implication constitute such surgeon the representative pro hac vice (for this disability) of his patient, and will, within the scope to which such implication applies, cast on him the responsibility of so acting in the interest of his patient that the latter shall receive the full benefit of that professional judgment and skill to which he is legally entitled. Such implication affords no license to the surgeon to operate on a patient against his will or by subterfuge, or to perform on him any operation of a sort different from that to which he had consented or that involved risks and results of a kind not contemplated. As to such matters, the rule in question submits nothing to the judgment of the surgeon, who as the implied representative of his patient can under such implication truly represent him only in so far as he gives to him the benefit of his professional wisdom within the general lines of the curative treatment agreed on between them, unless, of course, a wider discretion has been accorded to him. Within such general lines, however, much is necessarily left to the good judgment of the operating surgeon, just how much will depend on the circumstances of the individual case.

If the surgeon transcends his implied authority as thus defined, the question of his skill and wisdom is irrelevant, since no amount of professional skill can justify the substitution of the will of the surgeon for that of his patient; but where this is not the case, and where the act done or the decision made in the interest of the patient is fairly within the implied duty and authority of the surgeon, the question for the jury is whether on the evidence it appears that such professional skill and wisdom as the patient was entitled to receive had been exercised by the surgeon in his behalf, not whether in the opinion of the jury the surgeon had acted wisely or whether the patient had been benefited.

Such being the question for the jury, the admissibility of the technical or expert evidence on which it rests presents, as in other cases of relevancy, a preliminary question for the court which in the present case the trial judge rightly resolved in favor of the admission of such evidence. A ruling that the operation that was performed by the defendant was of a different sort from that to which the patient had consented would be based on too narrow a view. The condition for the cure of which the plaintiff applied to the defendant was rupture. He was therefore presumed to have contemplated all of the risks incident to an operation for such a condition. Now rupture is simply a protrusion of the intestine. Whether it occurs on the right side or on the left the intestine is the same, the muscular wall is the same, and the operation is the same, and its dangers and the risks are the same.

The real question is one to be settled, not by authority, but by reason, and its importance is such that it touches at a vital point the interests of the entire public, any member of which may at any time suffer in life or health by the establishment of a rule that will paralyze the judgment of the surgeon and require him to withhold his skill and wisdom at the very juncture when they are most needed, and when, could the patient have been consulted, he would manifestly have insisted on their being exercised in his behalf. This concluding suggestion may perhaps be ethical rather than legal, but it does seem that in good morals a patient ought not, in his efforts to obtain a money verdict, to be permitted to repudiate the sound judgment exercised in his behalf by the surgeon of his choice, in whose judgment he would unquestionably have concurred.

Society Proceedings

COMING MEETINGS

American Physiological Society, Cleveland, Dec. 26-28.
Southern Surg. and Gynec. Assn., Old Point Comfort, Va., Dec. 17-19.
Western Surgical and Gynec. Assn., Cincinnati, Dec. 20-21.

MEDICAL SOCIETY OF VIRGINIA

Forty-Third Annual Meeting, held in Norfolk, Va., Oct. 22-25, 1912

The list of officers elected for next year was given in THE JOURNAL, November 2, page 1636.

Gastric and Duodenal Ulcer

DR. J. S. DAVIS, Charlottesville: In one case of supposed stomach ulcer, with pain felt directly on swallowing, a pruneseed was found imbedded in the lower esophagus. Males predominate among gastric ulcer patients, text-books to the contrary notwithstanding. Hasty eating and worry predispose, and this makes doctors specially liable. In one case

the odor of hydrogen sulphid was present and the colon bacillus was found. Of forty-five cases seen at the University of Virginia, twenty-five were gastric; only three occurred in colored persons, two of whom were bright mulatto; the ages were from 18 to 65. The impregnation test is of some value; in this test the patient swallows the end of a thread and retains it in the stomach all night; then it is withdrawn and examined for blood, bile, etc. Roentgen-ray examination will show deflection of the peristaltic wave at the ulcer.

Medical Treatment of Gastric and Duodenal Ulcer

DR. J. G. NELSON, Richmond: Little that is new has been added in the last year or two. Why should not incisions and needle-wounds become ulcers? They do not. There is the same neuropathic condition, the same neuritis or definite microbic invasion. A local diminished resistance is now accepted as the most tenable theory. A large percentage of patients recover if properly handled. Acute non-perforating ulcer should be exempt from incision. Practically rest, regulation of the diet, bismuth and epinephrin make up most of the treatment, and of these rest is the most important. The stomach wall must be kept still. Rectal feeding may be used; no long tube is required, but injection should be made slowly, at six-hour intervals. Concentrated solutions of sugar are irritating, but cane-sugar less so than grape-sugar. Bismuth subcarbonate may be given in doses of from 300 to 400 grains; no constipating effect need be feared; or chalk, 1 dram in a little water, may be given. Treatment should be long enough, and the patient kept under observation a year or more. For hemorrhage, morphin is the best agent.

Surgical Treatment of Gastric and Duodenal Ulcer

DR. LOMAX GWATHMEY, Norfolk: Bear in mind the possibility of acute perforation, and obtain prompt surgical consultation if this occurs. Acute hemorrhage is not always an indication for surgical treatment. Immediate gastrojejunostomy will control. Repeated hemorrhage demands operation. Experience makes me advocate early operation. It is important to recognize symptoms, and not to give cathartics or morphin, masking the symptoms for the surgical consultant. Right rectus incision gives the best results, and speed spells success. Look for multiple ulcers.

Pyloric Ulcer Secondary to Appendicitis, Colitis and Other Foci of Infection Within the Portal Area

DR. G. PAUL LAROQUE, Richmond: Bacterial cultures are invariably positive in tissues taken from chronic gastric ulcer. Chronic appendicitis presents striking similarities, and also differences. As to ages, the average for appendicitis is 25 years, for pyloric ulcer 34, for biliary calculi 39, for duodenal ulcer 45, and for gastric ulcer 48. Acute ulcer can be produced by experimental infection. The first part of the duodenum soon will not be called duodenum at all, but part of the stomach. It has no valvulae conniventes. Pyloric ulcer is probably always primary.

DISCUSSION

DR. W. P. CARR, Washington, D. C.: Slowing of food in the stomach, shown by skiagram, may be due to anatomic stricture or spasm of the pylorus; when the latter, on operation no apparent change is seen in the pylorus. It is produced by irritating substances in the stomach, acting either at long intervals or constantly. In all chronic ulcers, there is some form of obstruction. Patients may recover from acute ulcers, but they nearly always recur. The chronic ulcer is always surgical from the beginning. The coincidence of appendicitis, gall-bladder infections, etc., with stomach ulcer, does not show appendicitis, etc., to be the cause, but vice versa. Infection travels downward, not upward.

DR. J. S. HORSLEY, Richmond: One point I wish to emphasize is that chronic indigestion, unrelieved by medicines in about six or eight months, is a surgical condition.

DR. P. S. ROY, Washington, D. C.: In differential diagnosis, the hemoglobin index plays an important part. I recently had a patient, a neurotic girl of 22, with hematemesis, who had been treated by a distinguished Boston man. I found that this bore relation to menstrual periods. I treated only the nervous condition, and the patient seems to have recovered entirely. I do not think it common for cancer to start on ulcer.

DR. I. S. STONE, Washington, D. C.: We see these associated lesions constantly in cases in which we operate, such as fibroid tumors, etc., when no suspicion of stomach ulcer exists.

DR. GEORGE TULLY VAUGHAN, Washington, D. C.: If symptoms are evident, submit the case to medical treatment for six or eight weeks; if no relief follows, then call in a surgeon. It is a mystery why surgeons hesitate to operate in acute hemorrhage. In nearly all other forms of acute hemorrhage they operate right away. The obvious thing to do is to stop the hemorrhage in gastric ulcer as in typhoid perforation. All agree as to the propriety of operating in chronic cases. Pylorectomy is the ideal operation for this condition. Take out the pylorus if your patient can stand it.

DR. KIRKLAND RUFFIN, Norfolk: The important thing to decide is whether the digestive disturbance comes from conditions in the abdomen or other general conditions. I operated in two cases of gastric disturbance in pellagra, the skin symptoms being dormant.

Old and Modern Theories of Fetal Development, with Report of a Case of Boy with Three Legs

DR. STUART MCGUIRE, Richmond: This child was born with three legs of equal length, the third leg being attached to the pubes just above the penis. The mother was satisfied that it was the result of maternal impression. She was advised to wait till the child was 2 or 3 years old, and then have it removed. Nothing further was heard of the case until last summer, when the youth was brought to me, 13 years old. The leg had been carried doubled on the abdomen and held by a bandage. There was no patella, and the foot had nine toes. The leg was removed and the boy made a perfect recovery.

Protection and Repair of the Perineum

DR. GREER BAUGHMAN, Richmond: I deliver with the patient in the lithotomy position until the head is about to be expelled. Then I bathe the vulva and thighs in sterile solutions, compound solution of cresol, etc., give an anesthetic to the obstetric degree, have the nurse extend the legs and evert the feet, bringing the thighs as close together as possible with the heels in and the toes out, and I gather up the fascia and try to deliver between pains. In delivering the shoulders I have to have more room, so I separate the thighs a little. The advantage of extending the thighs is that the skin from the buttocks is put at the disposal of the perineum. The method was suggested by Dr. Charles Robins. If tear occurs, I repair at once, using separate catgut suture for each tear; if the rectum is torn, silkworm-gut suture may be used.

Indications for Cesarean Section

DR. VIRGINIUS HARRISON, Richmond: Placenta praevia, eclampsia, contracted pelvis, tumors and cancer of the cervix, vagina or rectum, are the indications for the operation. The vaginal route is not indicated in many cases in my opinion; even if the child lives you generally have a badly torn perineum, and the other way you have a clean wound to heal. The vaginal route seems to be the choice of most operators in eclamptic cases. Physical incapacity of a senile uterus may be put down as a sixth indication. Inaction is the worst possible policy in eclamptic cases.

DISCUSSION

DR. R. L. PAYNE, Norfolk: Mortality statistics on placenta praevia are unreliable. Repeated tamponades and repeated examinations are liable to infect. The proper treatment of placenta praevia begins when the hemorrhage begins and admits of no delay. We have no right to jeopardize the life of the mother while waiting for the viability of the child. Statistics do not show so favorably as to the lives of mothers; only a few more children are born, of whom a large per-

centage die later. The game is not worth the candle. Statistics come largely from the hospitals. Another argument against this is, if we establish this rule the mortality will be very high, because most patients cannot be taken to hospitals.

DR. STEPHEN HARNSBERGER, Catlett: I have had three craniotomy and three placenta praevia cases; the mothers all lived and the children all died. In all six cases cesarean section should have been done. It is a justifiable and proper operation.

DR. A. B. HOOE, Washington, D. C.: Dr. Harnsberger did not make it so emphatic as he should; the operation should be resorted to if speedy delivery is necessary, in eclampsia and placenta praevia especially. When disproportion between the size of the head and the natural passages exists, cesarean section is always resorted to. Perhaps epileptics are sometimes caused by the use of high forceps, or by the child remaining in the birth canal too long. I condemn high forceps.

DR. W. E. MCGUIRE, Richmond: Every case should be treated according to individual indications. I have never seen a case in which placenta praevia was an indication for cesarean section. Treatment should be given at the time of the first hemorrhage. I have never done cesarean section for hemorrhage, but have done it for dystocia and eclampsia.

DR. GEORGE TUCKER HARRISON, Charlottesville: I use the abdominal way only in central implantation and in contracted pelvis. I have tried the old game of morphin and eliminatives, but the sooner you empty the uterus, the sooner you save the mother.

Treatment of Fracture of the Femur

DR. A. R. SHANDS, Washington, D. C.: The chief responsibility is to prevent shortening, and muscle spasm the chief factor to overcome, a spastic contraction of the most powerful muscles in the body. Overcome the muscle contraction, hold the fragments in place and apply a spica from the nipple to the toes. Make a skiagram to see if leg is in proper position. If you cannot hold the fragments in apposition by reason of obliquity of the fracture, then operate.

DISCUSSION

DR. S. S. GALE, Roanoke: Recently I visited a hospital in Colorado, and there saw three or four cases of fracture of the femur. I learned a point worth remembering, the use of a Buck's extension with excessive weight, 30 to 50 pounds, depending on the muscular strength to be overcome. I have tried it in one case, in a muscular colored man with fracture near the neck of the femur. My assistant put it up first, with 15 or 20 pounds. Pain persisted. I put on 50 pounds, the limb came down, the muscle was paralyzed, and the man obtained immediate relief from pain. I kept it on two weeks or more, when the muscle was thoroughly paralyzed; then I used a plaster cast. I prefer to plate or wire by the open method. Interposition of muscle tissue often prevents union.

DR. GEORGE TULLY VAUGHAN, Washington, D. C.: It is much easier to use this in children than in adults. I have used Lane plates almost constantly in place of wire; they do not slip as wire does. Nevertheless they are necessary evils. Do not use them unless necessary.

The Work of Health Departments

DR. E. C. LEVY, Richmond: The Virginia Public Health Association has the most important function of any body of men in the state. Health officers should not only be trained in practical science, but should be conversant with the business end as well. Training as a physician does not train one as a health officer, but it will be many years before we have other than practicing physicians as health officers in the smaller places. If he cannot acquire the information before, he must do it after he is inducted into office.

A System of Segregated and Protected Prostitution

DR. P. S. SCHENCK, Norfolk: The scope depends on the size of the town and the amount of funds. The per capita taxation required is greater in small communities than in large, 50 cents per capita in the smaller, and 40 cents in the larger cities per year. This expenditure pays large dividends in the way of inducing investments. There are only two cities in the United States, so far as I know, in which a systematic inspection of the segregated area is in operation; these are Norfolk and San Francisco. We require the landlady to report the arrival or departure of any inmate. On complaint of infection we send a police officer and a doctor. We have four inspectors. There was so much complaint from the U. S. Navy of men becoming infected at Norfolk that we had to do this. We invoked the aid of the police department and made a canvass of every house in the city. We inspect and take swabs; if clean we issue cards good for fifteen days. Each inmate is reported, and cannot "have company" unless she has her card posted in the room. A fine of $50 and costs is imposed for failure to comply with these requirements, repeated frequently if need be. If an inmate is found infected, she is put in quarantine and in charge of a physician. If she cannot pay she is treated by the city. Venereal diseases are not legally reportable here, but often are reported. If complaint is made to us of infection, and the man will cooperate, we send a police officer with him. He identifies the woman, and she is quarantined and treated. Our system has proved eminently satisfactory.

DR. E. G. WILLIAMS, Richmond: Our work has reduced the number of typhoid cases in the state nearly one-half, and the cases of tuberculosis are reduced about 4,000. Curiously diphtheria has apparently increased. I think this is due to giving immunizing doses, which do not prevent the recipients from becoming carriers. The number of cases has increased, but the death-rate has decreased from 7 to 3.5 per cent.

The Cause of Death in Intestinal Obstruction

DR. HARVEY B. STONE, Baltimore: Three classical ideas are maintained: (1) general infection, (2) overwhelming nervous centers, (3) toxic absorption. As to the third, ideas have been vague, and our experiments on dogs bear on this particular idea. We were forced to the conclusion that the toxic material was the secretion from the mucous membrane, the obstruction leading to a perversion of its physiology, somewhat analogous to exophthalmic goiter. These observations confirm clinical experience as to drainage. We found that the toxin is much richer in the cases of high obstruction than in low. To correlate our experiments, we were fortunate enough to obtain similar material from two cases in man. This was as toxic as that from the dogs.

DR. J. S. HORSLEY, Richmond: I have always had a suspicion that this material was in the mucous membrane, but why does it act this way? Is it caused by the interference with the lumen or with the circulation? I think it must be with the circulation. It has a practical bearing on, say, intussusception. In two cases of this I resected, and the patients recovered, while in a reduction in two cases, one patient died with high temperature and cerebral symptoms.

Blood-Pressure

DR. J. W. PRESTON, Roanoke: I addressed a series of questions to five authors of leading text-books. 1. "Do your observations lead you to believe the normal blood-pressure during pregnancy, preceding the onset of labor, to be higher than in the non-pregnant?" B. C. Hirst and J. C. Edgar hold that there should be no rise; J. C. Webster states that there is usually a slight rise; E. C. Davis says that there is a uniform rise of from 10 to 30 mm. 2. "Do you find toxemias leading to eclampsia, either in the presence or absence of albuminuria, uniformly accompanied by an abnormal rise of blood-pressure?" All replied in the affirmative, including J. W. Williams, though Davis notes in certain desperate cases that it may be abnormally low. 3. "Do you consider blood-pressure estimation of material aid in the prognosis and treatment of such cases?" All replied in the affirmative, and Williams adds, "The higher the blood-pressure in the pre-eclamptic state, the less amenable I consider the patient to prophylactic treatment."

KENTUCKY STATE MEDICAL ASSOCIATION

Fifty-Seventh Annual Meeting, held at Louisville, Oct. 28-31, 1912

The President, DR. D. O. HANCOCK, Henderson, in the Chair

The officers elected were named, November 9, page 1726.

Serum Treatment of Cerebrospinal Meningitis

DR. DONALD K. CLARK, Louisville: The curative effects of the serum depend on its early use. This, in turn, depends on the early diagnosis. All suspicious cases should be subjected to lumbar puncture, and the spinal fluid examined for the meningococcus. By the early use of the serum the mortality may be reduced 15 or 16 per cent. The introduction of fluids into the spinal canal is never devoid of danger. No hesitancy should be felt about giving repeated doses of the serum. A case that does not respond to four doses may respond to eight or more.

Typhoid Carriers

DR. A. DIXON, Henderson: All carriers should have individual articles which they use in every-day life, such as dishes, basins, towels, etc. Water-closets used by carriers should receive regular and systematic disinfection, and carriers should be required to disinfect their hands after each visit to the water-closet. Thoroughly washing with soap and water suffices in carriers of some occupations, but if there is a possibility of the carrier handling foodstuffs, an antiseptic solution should be used in addition. The administration of typhoid vaccine as a cure for carriers seems to give better promise than any other procedure.

Blood-Pictures in Tuberculosis

DR. EVERETT MORRIS, Sulphur: Blood-pictures in pulmonary tuberculosis show, as a rule, a low percentage of hemoglobin, a normal or increased number of erythrocytes, a subnormal color-index, an increased number of leukocytes, an increase in polymorphonuclears and a decrease in mononuclears, small lymphocytes and eosinophils as the disease progresses. The transitional cells appear to remain constant without regard to stage, extent or activity of the infection. Leukocytic pictures in pulmonary tuberculosis portray more accurately the patient's resistive force than does the extent of the lesion. Arneth's differential neutrophilic count is practical and no examination is complete in tuberculosis without the blood-pictures.

Infant Mortality, Its Causes and Prevention

DR. HENRY ENOS TULEY, Louisville: As far back as 1893 it was shown by Eross, who studied the statistics of 1,439,056 children in sixteen large European cities, that 10 per cent. of the children born alive die within the first four weeks of life. This mortality was greatest on the first day and diminished each day as the child grew older. Further, congenital debility is given as a cause of death in 54 per cent. of infants which died within four weeks after birth. Prof. Irving Fisher states that in a series of 100 cases of premature births, 40 were preventable; of 100 children dying of congenital debility 40 might have been saved; and of 100 children dying of venereal diseases 70 might have been saved.

The question of feeding the new-born infant is paramount in a discussion of this subject. More cases of athrepsia, malnutrition and acute gastro-intestinal disturbances with a fatal ending have their origin in an improper diet during the first few weeks of life, than from any other cause. The community plan of caring for infant welfare is productive of the greatest good in the reduction of infant mortality. Wilbur Phillips has estimated that the average cost of caring by preventive methods for the health of one baby for one year is $6, and the average cost to parents in Milwaukee to rear babies to the average age to which they die (about four months), of paying for confinement, for baby carriages, doctor's bills, etc., is $120. He estimated then that saving the death of one baby would pay the community for providing medical and nursing supervision for twenty babies for an entire year. By establishing stations in the localities where statistics show the greatest morbidity and mortality to be, which would be a center for dispensing clean, cold milk for caring for the mothers of all babies in the district, and for providing medical and nursing service, to be paid for by the city, many babies will be saved to society and a great financial saving brought about to the community.

Self-Medication

DR. J. H. HOHNSTEDT, Fort Thomas: When the laity awakens to a realization of the harmful effects in the indiscriminate use of self-prescribed remedies, and gives them up for those scientifically indicated after an intelligent diagnosis has been made, we may look forward to a better race in which all preventable diseases will gradually be eliminated. The laity will learn that hygienic conditions and a properly prescribed remedy are essential to the preservation of health and the cure of diseases. The admissions to our insane and blind asylums will gradually decrease in number and our criminally defective will become fewer, thus permitting our asylums to become hospitals and homes for the sick and aged.

The Passing of Destructive Operations in Obstetrics

DR. EDWARD SPEIDEL, Louisville: Craniotomy is justifiable on the living child in undoubted cases of hydrocephalus. Under all other circumstances delivery should be effected by abdominal cesarean section, if not possible by the vaginal route. A destructive operation is necessary on the dead child in impacted shoulder presentations. In all other cases, delivery should be attempted by version, and in extreme cases of pelvic contraction, even the dead child should be delivered by cesarean section, as the safest and most conservative method for the mother.

Endometritis

DR. WILLIAM L. MOSBY, Bardwell: Curettage of the uterus should be done in the infectious and chronic forms of endometritis that have proved rebellious to local and constitutional methods of treatment. When inflammation exists in the adnexa with immovable uterus, sensitive to the touch, there is increased danger of lymphangitis or peritonitis. The dull curet, like the uterine sound in these cases, is equally to be condemned as it opens up new avenues, supplies fresh material for infection and is powerless for good. This important gynecologic operation should be done only under proper surgical environment and with sufficient surgical skill to promise the patient all that modern gynecology offers.

Pellagra as a Public Health Problem

DR. O. P. NUCKOLS, Pineville: A commission should have power to prosecute all measures of protection of the public, by having the power to isolate and remove to the hospital all patients with pellagra, within the hospital district, in whom a positive diagnosis can be made. All data connected with every case should be collected carefully and preserved, and each case made a special study. The commission should act in conjunction with the state board of health, and the county boards of health, in carrying out all measures of general sanitation in the pellagra district. The treatment carried out at the pellagra hospital should be of the most approved methods, including hydrotherapy and all other adjuncts that will be of advantage in arresting the disease. Until pellagra patients are segregated, and cease to be a source of further spread, pellagra will grow and flourish, but if it is dealt with promptly, scientifically and humanely, it will soon be a relic of history.

Pellagra in Eastern Kentucky

DR. J. H. HENDREN, Cary: The use of Indian corn and its products as a food has nothing to do with the cause of pellagra or with the continuation of its symptoms, even after it has been caused by some other agency. There is probably an intermediate host, but the evidence at the present time is not sufficient to incriminate the *Simulidae* of Sambon. No physician is justified in diagnosing a case as pellagra until the eruptive stage has appeared. Pellagra is not contagious *in utero*, nor can it be transmitted from mother to child through the medium of mother's milk. A large percentage of the cases appear to be associated with or are in the wake of some other disease, as measles or small-pox. The disease is caused by a microorganism. The germs of the

disease are located principally in the brain and spinal cord, and ordinarily do not circulate in the blood-stream. The cure for pellagra will be found in the use of arsenical compounds, possibly one not yet brought out, and most probably one used intravenously. Until we know more of the cause of pellagra, segregation and prophylactic measures are useless. The eruption of pellagra is not due to the germs of the disease *per se*, but to the toxins generated by them. A large number of patients seem to develop an immunity to the disease, each attack growing less and less severe until the disease disappears. All proof of its transmissibility from person to person seems negative, although there is strong evidence that it is a house infection.

Acute Suppurative Otitis Media, Its Recognition and Treatment by the General Practitioner

DR. C. T. WOLFE, Louisville: An important requisite to an early diagnosis is the ability to recognize a normal drum membrane. An early otoscopic examination will show a red and thickened drum membrane which, as the suppurative process advances, bulges into the external auditory canal, depending on the amount of secretion within the tympanic cavity. Soon the bulging seems to become particularly distinct in one or more segments, more especially in the posterior superior quadrant; in the more severe types large blebs may be present in the layers of the tympanic membrane. An incision should be made at this time, extending from Schrapnel's membrane to the floor, through the bulging part. This is imperative from the fact that should spontaneous rupture be permitted to occur, irreparable damage may be done to the drum membrane and other intratympanic parts from the pressure of the secretions. This operation is not difficult and the details are readily learned. We may look on the prognosis from a favorable point of view, provided that the case has been properly managed and has received modern treatment. The treatment resolves itself into two parts. The first consists in the alleviation of pain, evacuation of the pus from the middle ear, the maintenance of proper drainage and, if possible, the prevention of complications. The second consists in the removal of such factors as are conducive to a recurrence of the disease.

Diagnostic Errors in Diseases of Children

DR. ROBERT H. MOSS, Henderson: Every pediatrician of large experience knows that the pain of pleurisy and pneumonia in children is referred to the abdomen as frequently as to the chest. There are three things that a physician should always think of in the case of a child with an acute abdominal pain—pneumonia, appendicitis and intussusception—and I would emphasize most strongly the importance of careful and repeated examination of the lungs in all acute abdominal affections in early life. The inhalation of foreign bodies often gives rise to puzzling clinical pictures. The infant may have a suffocative attack, or paroxysm of coughing from which he quickly recovers; later on the symptoms of an acute bronchitis or pneumonia become manifest, and all too often the causative relation of the foreign body is unsuspected. I treated an infant for a bronchopneumonia for about two weeks, when one day during a severe paroxysm of cough, a wheat grain was expelled, after which recovery rapidly supervened.

Rachitis is considered by some authorities to be more frequently overlooked than any other disease. Doubtless one reason for the widespread failure to recognize this condition is that our attention has been generally centered on the changes; in other words, one of the terminal events. It is practically agreed by all pediatricians that underlying the syndrome there is a dietetic error, with a superadded digestive disturbance. Some authors contend that the accompanying indigestion is always present and is the chief contributory factor.

Management of Puerperal Eclampsia

DR. W. B. MOORE, Cynthiana: Many of the measures advocated from time to time in the management of eclampsia are worse than useless. Pilocarpin, at one time held in high esteem, is a dangerous drug in this condition. It strongly predisposes to pulmonary edema. The consensus of opinion to-day favors rapid delivery. The point in dispute is the method of emptying the uterus. This must depend on the condition of the cervix, the time of pregnancy, the surroundings of the patient and the skill of the attending physician. We believe that the greatest good to the greatest number will result from a campaign of education. Instruct the women of this country that any variation from normal health during the period of gestation may be the beginning of a serious condition, and that the safety of each lies in following the instructions of an intelligent physician. If this procedure is faithfully carried out, the management of eclampsia will be solved without the dangers of chloroform narcosis and surgical operations, in the desperate attempt to save these patients from an untimely grave.

Management of Placenta Praevia

DR. WALKER B. GOSSETT, Louisville: The first danger in placenta praevia is that of hemorrhage which may occur without any warning, the patient being at rest, or following coughing, sneezing, straining at stool or lifting. The degree of collapse will generally depend on the extent of the bleeding. The second danger is that of sepsis following the delivery, and these cases are more prone to puerperal sepsis; therefore absolute surgical obstetric asepsis must be observed; no objection can be made to the use of rubber gloves in these cases, as they have gone beyond physiologic labor and are in a pathologic condition. The first treatment for ordinary domestic practice, when the bleeding has to be arrested before labor has begun and when the cervix is not dilated, is the tampon; plug both cervix and vagina. When the cervix is dilated or dilatable to the extent of permitting two fingers being passed through it, I perform podalic version and deliver. As to rupturing the membranes, this should be done to the side if possible; if not, go through the placenta. Do not be hurried in the extraction of the child. The child's thigh and breech should be pushed through the cervix by the uterine contractors, not dragged through, unless there is some reason for making a quick delivery. I always depend on gauze plugging and my hand in these cases.

Perinephritis

DR. W. L. CASH, Princeton: In the treatment of perinephritis, the patient should be put to bed and kept as quiet as possible throughout the attack. Hot fomentations or an ice-bag should be applied over the affected side, purgation should be by means of calomel, and urinary antiseptics should be given. If these measures fail to bring about resolution, and suppuration becomes inevitable, a poultice may be used to hasten the formation of the pus. When the abscess forms, the treatment is distinctly surgical. There should be free incision, thorough exploration and adequate drainage. The toxemia should be combated by generous diet, stimulants and tonics.

(To be continued)

COLLEGE OF PHYSICIANS OF PHILADELPHIA

Meeting held Oct. 2, 1912

The President, DR. GEORGE E. DESCHWEINITZ, in the Chair

The Spinal Cord in Pernicious Anemia

DR. ROBERT N. WILLSON, JR.: It is well to remember that there exist spinal cord and perhaps brain changes in every case of true pernicious anemia, and that many cases that fail of prompt recognition, owing to nervous symptoms, would at once become clear if this fact were kept in mind. The likelihood that both the clinical picture and the cord degeneration are secondary to and the direct result of a definite toxemia has been hinted at, but the nature and source of this toxin and its method of action are still matters of speculation. In my case there is a marked clinical indication of a pathologic intestinal process dating back to childhood and terminating only in the gastric crises which indicated, perhaps, the final influence of the auto-intoxication on the spinal cord. It seems evident that the toxemia led to the pernicious anemia, the spinal cord degeneration and sclerosis, and the fatal termination of the case.

Of no slight interest is the series of instances in the patient's near and immediate family connection of pathologic clinical pictures which suggested a definite relation between the pernicious anemia and combined sclerosis in my patient, the father's arteriosclerosis and uremic "stroke," the mother's aortic insufficiency and hepatic cirrhosis, with the renal sclerosis and angina pectoris of one aunt, and the pernicious anemia of another, to say nothing of the death of a third aunt (all three sisters of the mother) in an advanced stage of locomotor ataxia. The working of syphilis through the gastro-intestinal tract and its influence on the blood and on the spinal cord through a gastro-intestinal autotoxemia have not been so thoroughly considered, and this theory is offered not without a certain measure of plausibility in the case under study.

The Topography of the Valves of the Heart as Shown by the Roentgen Ray

DR. GEORGE FETTEROLF and DR. GEORGE W. NORRIS: In the method adopted frozen sections of the thorax of formaldehyd-hardened cadavers were cut into horizontal sections an inch in thickness. Both sides of the valve leaflets of the exposed sections were painted with thick lead paint and photographed with the Roentgen ray. Fifteen bodies were thus studied with a view to determining the normal relationship of the cardiac valves to the anterior thoracic wall. Inasmuch as many of the bodies studied revealed pathologic topographic relations of the thoracic viscera, no normal standard could be established. The communication is therefore made in the nature of a preliminary report with a view to describing a hitherto unemployed and entirely feasible method of studying the position of the valves of the heart in health and disease.

Physical Examination of the Liver

DR. JOSEPH SAILER: Examination of the liver involves: (1) The position of the upper border of liver dulness; (2) its contour; (3) the position of the lower border of liver dulness; (4) the position of the left border; (5) the character of the edge; (6) the character of the surface; (7) the palpability of the liver posteriorly which involves bimanual palpation; (8) the motility of the liver, and (9) the existence of pulsation.

DISCUSSION

DR. HERMAN B. ALLYN: In one of two cases seen last winter the patient was a boy who had a large liver as the result of cardiac disease. The boy developed late in the disease a fluctuating tumor on the surface of the liver at the usual site of the gall-bladder. This was supposed to be an enlarged gall-bladder, but later there appeared also other nodules about the size of marbles. The mass was distinctly fluctuating and, inasmuch as the blood gave a positive Wassermann, we looked on it as possible softened gummata. But at autopsy we found cysts beneath the serous coat of the liver. I never before saw nodules of this size and due to this cause. The other case was that of a woman with secondary sarcomatous mass developing beneath the left border of the liver which moved freely with respiration. It was found to be a mass connected with the omentum and not attached to the liver.

Current Medical Literature

AMERICAN

Titles marked with an asterisk (*) are abstracted below.

American Journal of Medical Sciences, Philadelphia

November, CXLIV, No. 5, pp. 625-780

1 *Tertiary Syphilis of Liver. T. McCrae, Philadelphia.
2 *Maltose in Infant-Feeding. J. L. Morse, Boston.
3 Bismuth Poisoning. L. M. Warfield, Milwaukee, Wis.
4 *Weight Curves in Typhoid. W. Coleman, New York.
5 *Observations on Scarlet Fever, Diphtheria and Measles at Cincinnati Contagious Hospital. A. J. Bell, Cincinnati.
6 Studies on Motor Functions of Stomach by Use of Gastric and Duodenal Fistulas, Special Reference to Influence of Bitter Waters and Bitter Salts. T. R. Brown, Baltimore.
7 More Common Forms of Cardiac Irregularity, with Report of Case of Heart-Block. T. A. Claytor, Washington, D. C.
8 *Cryptogenetic Granulomatosis of Stomach. O. C. Gruner and E. J. Mullaly, Montreal, Canada.
9 Alimentary Hypersecretion of Chronic Ulcer as Shown by Lactose Test Meal. D. Roberts, Brooklyn.
10 Intermittent Spinal Claudication; Report of Two Cases. F. F. D. Reckford, Philadelphia.
11 Metastasis of Hypernephroma in Nervous System: Jacksonian Epilepsy Caused by Such Lesion. J. Collins and R. G. Armour, New York.
12 Metabolic Observations on Amyotonia Congenita. J. C. Gittings and R. Pemberton, Philadelphia.

1. **Tertiary Syphilis of Liver.**—Syphilis of the liver, McCrae says, presents a very varied clinical picture with prominent general symptoms in many cases, of which loss in weight is marked. The duration of the symptoms may be prolonged and there may be periods of improvement. Fever is a common occurrence. There are features suggestive of hepatic disease in the majority of the cases. Enlargement or tumor is the most common. This may suggest other conditions, especially malignant disease. General enlargement and the occurrence of nodules or large rounded masses are the most common. A striking feature is the relatively marked enlargement of the left lobe as compared with the right. The diagnosis may be obscured by other diseased conditions or the liver condition may be interpreted wrongly. Ascites is sometimes a difficulty. Knowledge of the features of hepatic syphilis and the therapeutic test are important aids. Treatment can influence the syphilitic process, but not its results (cirrhosis, amyloid).

2. Abstracted in THE JOURNAL, July 13, p. 139.

4. **Weight Curves in Typhoid.**—The results of Coleman's observation are summarized in one sentence. It is possible to maintain patients suffering from typhoid in weight equilibrium throughout the entire course of the disease by giving them sufficient food.

5. **Scarlet Fever, Diphtheria and Measles.**—During the last year observations were made by Bell on over 300 cases of scarlet fever. The following summary indicates the findings in the so-called classical symptoms and diagnostic signs: Scarlet fever, 315 cases. Onset with vomiting, 50 per cent.; onset with headache, 4 per cent.; onset with sore throat, 65 per cent.; eruption, whole body, 46 per cent.; eruption, partial, 35 per cent.; mouth pallor, 57 per cent.; rash on soft palate, 38.6 per cent.; membrane on tonsils, 29 per cent.; papillae enlarged, 56 per cent.; glazed tongue, 17.7 per cent.; anterior cervical glands enlarged, 95 per cent.; submaxillary glands enlarged, 72 per cent.; eruption gone from body, five and one-half days; desquamation began in six and three-quarter days; blood-count, leukocytes average, 17,000; polymorphonuclears, average, 78 per cent.; large lymphocytes, average, 6.3 per cent.; small lymphocytes, average, 10.1 per cent.; eosinophils, average, 2 per cent.; albumin, 11 per cent.; granular casts, 4 per cent.; hyalin casts, 2.5 per cent.; blood cells, 4 per cent.; myocarditis, 6 per cent.; irregular heart, 3 per cent.; murmurs, 8 per cent.; mastoiditis (no facial palsy in this series), 1 per cent.; arthralgia (all cases had an immunizing dose of diphtheria antitoxin), 6 per cent.; acetone, 49.5 per cent.; diacetic acid, 22.6 per cent.; indican, 73 per cent.; temperature gone in five and two-third days; nephritis, 2 per cent. The average white count of patients who died was 17,262. Preponderance of the staphylococcus may have influenced all leukocyte counts.

The so-called Pastia's sign in this disease, namely, the accentuation of the rash in the normal folds, especially on the anterior surface of the elbow, was not noticed except in a few instances, so that no significance has been attached to it. Of like importance is the Rumpel-Leeds phenomenon or the hemorrhages at the elbow from compression of the upper arm by means of a bandage.

With the use of the ordinary antistreptococcic serum made up of streptococci not from scarlet fever patients Bell has noticed little benefit even in doses of 80 or 90 c.c. in twenty-four or thirty-six hours. If, he says, it is used at all, it should be made from the streptococci from blood, throat or glands of scarlet fever cases. The results with these stock vaccines were not brilliant. Patients using vaccines had no local treatment. Irrigations were employed for the others. Except in one or two instances he could not see that the discharge was in any way modified by the vaccine, and on the whole those having local

treatments ran a shorter course. The dosage in each case was started with about 200,000 and each succeeding dose was doubled at intervals of from two to ten days according to indications. This was carried up to 128,000,000 in some cases.

True relapses or reinfections were not observed, but delayed rashes occurred in one or two instances. Eighteen blood cultures were made during the year from scarlet fever patients. Of these nine were negative. In the other nine cases the *Staphylococcus pyogenes aureus* was recovered seven times and the *S. pyogenes albus* twice. The throat and nose cultures almost uniformly showed the presence of staphylococci, occasionally mixed with a few streptococci. Twelve cervical glands of scarlet fever patients were aspirated with aseptic precautions in an effort to corroborate the claims of Vipond made in the spring of 1911, that he had found the specific organism of scarlet fever in the glands of patients suffering from this disease. The cultures were sterile in nine cases; the *Staphylococcus pyogenes aureus* was isolated twice and the *B. pyocyaneus* once.

The following summary shows observations made on 76 cases of diphtheria: Onset with sore throat, 84 per cent.; onset with vomiting, 33 per cent.; membrane on tonsils, 85 per cent.; membrane on soft palate, 36 per cent.; inflammatory swelling, 30 per cent.; membrane gone on the average in two and seven-elevenths days; temperature normal on the average in three and three-quarter days; erythema (not from serum), 5 per cent.; urticaria (not from serum), 14 per cent.; otitis, 5 per cent.; albumin, 12 per cent.; adenitis, 47 per cent.; paralysis, soft palate, 5 per cent.; paralysis of other muscles, 4 per cent.; myocarditis, 16 per cent.; endocarditis, 28 per cent.; slow pulse, 4 per cent.; arthralgia, 2.6 per cent.; acetone, 28.5 per cent.; diacetic acid, 14 per cent.; indican, 32 per cent.; serum rashes, 16 per cent.; antitoxin, average dose, 40,000 units, highest dose, 355,000 units; blood-count: leukocytes, average, 13,633. The mortality for diphtheria as reported up to Jan. 1, 1912, was 3⅓ per cent.; while for scarlet fever it was 6.5 per cent.

8. **Granulomatosis of Stomach.**—The authors conclude that linitis plastica is not a new kind of morbid process, but is the effect of some chronic infective agent whose nature has not yet been determined. The process at work is often akin to the granulomatous process which occurs in mediastinal tissues and elsewhere; it is akin to the changes which occur in the course of some forms of tuberculosis and of diffuse sclerotic types of tertiary syphilis, and it is occasionally followed by the development of an epithelial growth, just as is sometimes noticed as a sequel to tuberculosis and syphilitic lesions. The disease known as linitis plastica, or cirrhosis of the stomach, only demands a separate name because it is clinically a simulator of true carcinoma. Its prognosis should be more favorable and its treatment by the surgeon more effective. The small degree of epithelial overgrowth which may be regarded by some observers as carcinomatous, is not really any greater in extent than are the atypical proliferations of epithelium which are known to result from the subcutaneous introduction of certain irritant lipoid soluble bodies. The suggestion is that the abnormal cells in this granulomatous tissue are pouring out substances which may excite the overgrowth of the glandular epithelial cells in the same way that many bodies (dimethylamidoazobenzol, amidoazotoluol, a-naphthylamine, methylimidazol, indol and skatol, etc.) were found to excite epithelial overgrowth by Wacker and Schmincke in 1911. This renders the development of carcinoma as a secondary process on a preexisting (often long-persistent) submucosal disease quite intelligible, and emphasizes the view which the authors would point out that the malignant change in this, as in "Hodgkin's disease," and in many lymphosarcomas (also in Paget's disease of bones), is not an inevitable sequence, but is superimposed by the succumbing of certain other tissues to the continued noxious action of abnormal cell-products.

Boston Medical and Surgical Journal

November 7, CLXVII, No. 19, pp. 639-671

13 Clinical Study of Respiration. D. L. Edsall, Boston.
14 *Pyelonephritis of Pregnancy and Puerperium. J. W. O'Connor, Worcester, Mass.
15 Adjustable Knee Support. H. W. Marshall, Boston.

14. **Pyelonephritis of Pregnancy and Puerperium.**—From the study of twenty-nine cases and a review of the literature, O'Connor concludes that infection of the pelvis of the kidney invariably involves the parenchyma. Owing to its anatomic relations the right kidney is the more vulnerable. The disease is much more frequent than supposed; O'Connor estimates that it occurs once in every 3,000 cases. Malnutrition, constipation and tonicity of the abdominal muscles are predisposing factors; tendency to renal abnormalities on the right, dextro-torsion of the uterus and predominance of positions in the right oblique diameter favor the infection of the right kidney. Infection by the colon bacillus is the most common type, direct transmission through the intestinal walls being the probable mode of entrance. The pathologic picture shows the pelvis and ureter dilated with pus and miliary abscesses in and beneath the cortex. The cardinal symptoms are smarting micturition, chills, fever, nausea and vomiting, pain in the loin and elevation of pulse. The urine is turbid, purulent and albuminous. Tenderness in the region of the kidney is always present. Enlargement of the organ can be demonstrated in about one-fifth of the cases. Abortion and surgical kidney are the most common complications. The diagnosis can generally be made on physical signs and urine analysis, the differentiation from appendicitis presenting the greatest difficulty. Prognosis is usually good for the mother and less favorable for the child. Treatment by rest, sedation, catharsis and urinary antisepsis has met with success. The use of vaccines and pelvic lavage, if of any real value at all, entails dangerous delays and, being extremely technical, is beyond the scope of the rank and file of the profession. Early operation in cases that assume a surgical aspect is to be strongly recommended.

Bulletin of Manila Medical Society

September, IV, No. 9, pp. 155-160

16 Pathology of Infant Apropos of a Necropsy. F. Calderon, Manila.

California State Journal of Medicine, San Francisco

November, X, No. 11, pp. 449-490

17 Value of Prisms in Eye-Strain. A. S. Green, San Francisco.
18 Labor in Moderately Contracted Pelves, with Special Reference to Cesarean Section. H. J. Kreutzman, San Francisco.
19 *Operative and Postoperative Tonsillar Hemorrhage. W. S. Franklin, San Francisco.
20 Thrombosis of Sigmoid Sinus and Jugular Vein, from Direct Tympanic Infection of Jugular Bulb. Report of Two Cases. H. Hastings, Los Angeles.
21 *Some Opinions Concerning Tonsil Surgery. C. C. Stephenson, Los Angeles.
22 Review of Recent Italian Eye Literature. V. F. Lucchetti, San Francisco.
23 Patulous Anus: Its Clinical Significance. A. J. Zobel, San Francisco.
24 Stenosis of Duodenum Due to Gall-Stones; Operation; Recovery. W. C. Voorsanger and C. G. Levison, San Francisco.
25 Cancer of Uterus. E. C. Mann, San Diego.
26 *Pellagra in California. V. H. Podstata and O. C. Willhite, Livermore.
27 Significance of Bacteria in Milk. S. Levin, Napa.
28 Hereditary Pigmented Nevus. A. Soiland, Los Angeles.
29 Complete Transposition of Viscera. F. W. Birtch, San Francisco.
30 Case of Pyema. W. B. Coffey and W. T. Cummins, San Francisco.

19. **Operative and Postoperative Tonsillar Hemorrhage.**—Franklin says that no patient should be permitted to leave the operating table until both cavities are dry. Every case of delayed primary or secondary hemorrhage he has encountered has given evidence, while on the operating table, of a tendency to bleed. At present he sutures every case in which, after ten minutes from the enucleation, the bleeding has not been stopped. He sees no possible objection to this procedure. The deformity is no greater following sewing than due to the cicatricial contraction of the average healed case. Following hemorrhage it is well to put the patient on a saline injection given by the Murphy drop method, and if the loss has been considerable the foot of the bed should be elevated, and morphin given subcutaneously. He emphasizes the importance of treating tonsillar hemorrhage surgically, i. e., by mechanically compressing the bleeding vessels. The Mikulicz tonsil hemostat is an old-fashioned, barbarous instrument. When applied it is

extremely uncomfortable to the patient and has a constant tendency to become dislodged. If held sufficiently tight to retain its position, it keeps the patient awake with saliva flowing from his mouth, pain over the wound and angle of the jaw and causes the sponge to adhere firmly to the cicatrizing surface. Franklin does not consider it safe or good practice to rely on chemical means for control of bleeding. It must be remembered that vaso-constrictors cause a secondary dilatation of the blood-vessels.

21. **Tonsil Surgery.**—Stephenson believes that a tonsillectomy is as severe, and should be classed, in point of gravity, the same as an appendectomy. He holds that all hypertrophied tonsils without lesion or grave complications should be removed. All tuberculous tonsils with lesions should be treated medically and never surgically. All tonsillectomies should be performed under general anesthesia, unless the condition of the patient is such that a general anesthetic would be dangerous. All tonsillectomies should be hospital cases, i. e., the operation should be performed in a hospital. All tonsillectomies should be followed by the passage of an adenoid curet. All curettages following a tonsillectomy should be followed by the passage of the finger. The hot wire ecraseur should never be used.

26. **Pellagra in California.**—The most important conclusion reached by the authors is that pellagra has been found to exist in three cases out of 180 consecutive cases admitted to a private sanatorium. None of the three cases was imported to the western coast, but evidently originated there. None of the patients belonged to the poverty stricken class of people. In all cases, however, nutritional disturbances preceded a long time the development of definite evidences of pellagra. In one case there is a definite history of long use of vegetable oils and this case happened to be the most acute, affecting the nervous system to the greatest extent and terminating fatally in the shortest time. All three cases evidently originated without any infection from similar cases and there is no evidence that anyone was so afflicted as a result of contact with them. While it is not claimed that pellagra had been a causative factor in the mental or nervous breakdown of any of the three cases, it is evident that in every case it has greatly and in a detrimental way influenced the mental and nervous condition. Cacodylate of sodium, tried in two of the three cases has not had any lasting beneficial effect on the disease. The same is true of all other treatment attempted.

Cleveland Medical Journal

October, XI, No. 10, pp. 693-762

31 Importance of Hospitals for Infants and Their Part in Prevention of Infant Mortality. L. E. Holt, New York.
32 History of Legislation in Ohio Regulating Practice of Medicine. L. H. Winch, Cleveland.
33 Treatment of Chronic Constipation. E. O. Houck, Cleveland.
34 Open-Air Schools of Cleveland. J. C. Placak, Cleveland.
35 Gastric Ulcer. J. Phillips and V. C. Rowland, Cleveland.

Journal-Lancet, Minneapolis

November 1, XXXII, No. 21, pp. 561-585

36 *Abdominal Incisions. R. E. Farr, Minneapolis.
37 *Phthalein Test in Group of Medical Cases. H. L. Ulrich, Minneapolis.
38 Our Duty to Public in Combat with Tuberculosis. W. A. Kriesel, Watertown, S. Dak.

36 and 37. Abstracted in THE JOURNAL, August 31, pp. 743 and 744.

Journal of Cutaneous Diseases, New York

November, XXX, No. 11, pp. 653-700

39 *Case of So-Called Prurigo Nodularis. J. Zeisler, Chicago.
40 Acanthosis Nigricans, with Report of Case. A. Schalek, Omaha, Neb.
41 Inquiry into Efficiency of Sulphur Lotions. O. H. Foerster, Milwaukee, Wis.
42 Diseases of Skin in Relation to Hepatic and Renal Disorders. L. D. Bulkley, New York.

39. **Prurigo Nodularis.**—Besides the general management by dietetic directions and the employment of internal antipruritics Zeisler made use of two rather powerful agents: a 10 per cent. chrysarobin varnish and repeated exposures to the Roentgen-rays. The latter had a curious effect. Under their influence the hard keratomatous growths seemed to soften and become transformed into vesicular lesions, which would gradually dry up and then could be easily removed *in toto*, leaving the underlying skin practically normal.

Journal of Indiana State Medical Association, Ft. Wayne

October 15, V, No. 10, pp. 419-464

43 Status of Medical Profession. W. F. Howat, Hammond.
44 Section on Ophthalmology and Otolaryngology of Indiana State Medical Association. G. F. Keiper, La Fayette.
45 Phthalein Test for Kidney Function. F. S. Crockette, La Fayette.
46 *Diagnosis of "Indigestion." J. V. Reed, Indianapolis.
47 *Treatment of Pulmonary Tuberculosis with Artificial Pneumothorax. W. A. Gekler, Rockville.

46 and 47. Abstracted in THE JOURNAL, November 2, pp. 1643 and 1644.

Journal of Outdoor Life, New York

November, IX, No. 11, pp. 257-286

48 Sleeping Out with Comfort. E. Cummins, Hinton, W. Va.
49 Clothing, Bedding and Furniture for Outdoor Life. T. S. Carrington.
50 A Sanatorium Commencement. A. M. Edwards, Monrovia, Cal.
51 Convalescent's Balcony Boxes. P. Lathyrus.

Kentucky Medical Journal, Bowling Green

October 15, X, No. 20, pp. 803-832

52 Pituitary Gland (a Pharmacologic Consideration). V. E. Simpson, Louisville.
53 Posture in Adolescent Period. J. D. Trawick, Louisville.
54 Vesical Papilloma. E. S. Allen, Louisville.
55 Cerebrospinal Meningitis. D. K. Clark, Louisville.
56 Embryonic Mixed Tumor of Kidney. W. H. Wathen, Louisville.
57 Two Cases of Nasopharyngeal Polyps. G. C. Hall, Louisville.

Lancet-Clinic, Cincinnati

November 2, CVIII, No. 18, pp. 467-500

58 Infant-Feeding. M. Ostheimer, Philadelphia.
59 Differential Diagnoses Reported from Cincinnati Tuberculosis Hospital. C. S. Rockhill and K. Dunham, Cincinnati.
60 Median Harelip. J. Razsohoff, Cincinnati.
61 Psychology of Sexual Inversion in Women. D. C. McMurthrie, New York.
62 Present Status of Roentgenotherapy in Gynecology. P. Shields, Cincinnati.

Medical Record, New York

November 9, LXXXII, No. 19, pp. 833-878

63 I. Some Data Concerning a Humoral Etiology of Spasmodic Asthma. II. Outline of Treatment in Accordance with Foregoing. B. Oettinger, Denver, Colo.
64 *Chronic Lymphatic Leukemia. M. B. Wesson, El Paso, Texas.
65 *Hemoptysis in Tuberculosis; Its Significance and Its Treatment. T. Frazer, Asheville, N. C.
66 Physician's Rôle in Preventive Medicine. D. B. Hardenbergh, Middletown, N. Y.
67 Effect of Experimental Hyperthermy on Opsonic Activity of Blood-Serum of Rabbit. G. A. Rueck, New York.
68 Unfortunate Predicament of Medical Profession. T. Dixon, Brooklyn.
69 Manic-Depressive Insanity. A. K. Petery, Norristown, Pa.
70 Case of Myopic Refraction Relieved by Eye Education. W. H. Bates, New York.

64. **Chronic Lymphatic Leukemia.**—The urine in the case studied by Wesson has been reduced in quantity, dark yellow to orange in color, turbid, specific gravity 1.025, acid reaction, no albumin or sugar. There is generally, in a twenty-four-hour specimen, a heavy, voluminous, brick-red sediment of amorphous urates. Not infrequently uric-acid crystals are present. A search for ferments in the urine disclosed the fact that there must have been some enzyme present (maltase) which had broken down the maltose molecule and that a proteolytic ferment was also present. There was no amylolytic ferment present. The presence of a fat-splitting enzyme was suggested but was not very positive at first; then it was quite evident that a lipase was present.

65. **Hemoptysis in Tuberculosis.**—Although there exists considerable difference of opinion as to the causes of hemoptysis, Frazer says there is practical uniformity in the methods employed in the treatment of this condition, despite the use of drugs apparently antagonistic in their action and other minor details. The first indication is to reduce blood-pressure. As hemoptyses are sometimes preceded by a sense of tightness in the chest or by the presence of blood-streaked sputum, it may be possible to prevent their occurrence by insisting on absolute rest and by the administration of a drug—such as the nitrites

—with the view of decreasing vascular pressure. Either of the following may be used:

℞	Gm. or c.c.		
Sp. nitroglycerin	1		♏ xv
Aquæ	60	or	ʒ ij

M. S. Dose: ʒ j.

℞	Gm. or c.c.		
Sodii nitritis	1		gr. xv
Aquæ	60	or	ʒ ij

M. S. Dose: ʒ j.

A teaspoonful of either of the above may be given every four hours for two or three days.

More commonly, perhaps, the patient receives no warning and the physician is summoned to treat an active hemorrhage. In the presence of this condition the indications are three in number: to secure absolute physical rest, to quiet the fears of the patient, and to lower the blood-pressure, attempting in this manner to favor the formation of a clot, which is nature's method of checking hemorrhage. This means that the patient must be put to bed and all unnecessary movements on his part must be avoided; he is not allowed to get up to attend to the demands of nature, nor is he allowed to talk. A comfortable position should be assumed: usually the semi-recumbent posture (with one or two pillows under the head) is best; and the patient should be assured in a few words that there is little cause for apprehension. Frazer's practice is to break one of the little "packages" of amyl nitrite, holding it for several minutes under the patient's nostrils. The patient should also receive atropin gr. 1/50 hypodermically, and this dose may be repeated two or three times within the next twenty-four hours. In place of atropin, nitroglycerin may be administered hypodermically in doses of gr. 1/100, repeated at short intervals, at first every half hour or hour, for three or four doses, later less frequently. After vasodilation has been obtained, more permanent effects may be secured by the use of sodium nitrite, gr. j, every three or four hours. Morphin, although used considerably in hemoptysis, should not be resorted to as a routine measure. It is indicated if the cough be troublesome, but its field of greatest usefulness is in those cases in which excessive nervous irritability exists. It is customary, at the onset of a hemorrhage, to place a light ice-bag over the precordium, with a view to quieting the heart's action.

There is no specific diet for patients with hemoptysis; but the amount given should be small and fluid in character (milk in small quantities and egg-albumen are suitable); especially is it necessary to restrict the diet during the first twenty-four hours. While depletion through the intestines by means of catharsis has been advised and is theoretically indicated, it is better to wait twenty-four hours before attempting to move the bowels on account of the exertion which this action imposes on the patient. Also examination of the chest should not be undertaken, or should be restricted to auscultation; under no circumstances should percussion be practiced. As to the length of time that a patient who has had an hemoptysis should stay in bed, there exists considerable difference of opinion; it is safer to insist on rest in bed for twenty-four to forty-eight hours after the expectoration of post-hemorrhagic clots has ceased.

New York Medical Journal

November 9, XCVI, No. 19, pp. 933-992

71 Gall-Stones. P. Syms, New York.
72 *Why Is Direct Transfusion of Blood Often a Failure? A. L. Soresi, New York.
73 Temperature After Perineal Section Under Spinal Anesthesia. E. L. Keyes and D. W. MacKenzie, New York.
74 Gwathmey-Woolsey Nitrous Oxid-Oxygen Apparatus. J. T. Gwathmey and W. C. Woolsey, New York.
75 Some Considerations of General Anesthesia. C. R. Hervey, Oswego, N. Y.
76 Operative Treatment for Cancer of Breast. J. S. Brown, Montclair, N. J.
77 Cure of Prolapse of Uterus and Bladder by Plastic Operation. L. G. Baldwin, New York.
78 Lane's Kink of Ileum. C. F. Kivlin, Troy, N. Y.
79 *Nasal Deformity Corrected by Auto-Implantation of Septal Cartilage. O. Glogau, New York.
80 Cause, Prevention and Care of Weak and Flat Feet. W. W. Stevens, Philadelphia.
81 Mortality of Lobar Pneumonia in Alcoholic Subjects. C. K. Stillman, Mystic, Conn.
82 Pustular Syphiloderm in Negress Simulating Variola. J. L. Kirby-Smith, Jacksonville, Fla.

72. **Direct Transfusion.**—Soresi insists that transfusion should not be resorted to only when the patient is in extremis; surgeons should train themselves on animals in conservative surgery of the blood-vessels before attempting transfusion in human beings; vein to vein method is to be preferred, and the use of a vein of the neck of the recipient is the only physiologically correct method to be adopted, except when not suitable during surgical operations. In hemorrhages there must be a distinction between hemorrhages which can be completely checked and hemorrhagic diseases; in the former saline solution should be administered immediately as first resort and during or before transfusion; in the latter, transfusion should be resorted to before other liquids are introduced into the system, because the blood is used as a hemostatic and should not be diluted; in the greatest number of hemorrhages saline solution is sufficient to save the patient and transfusion should be resorted to only when the surgeon thinks that the hemopoietic organs of the patient would be unable to supply, in a reasonable time, the morphologic elements indispensable to life. In diseases in which the blood is loaded with poisonous products, transfusion is very useful, provided that the central nervous system is not too seriously injured and blood is let out during or before transfusion is resorted to. Transfusion is a great help to patients who are considered bad surgical risks, and it must be performed during the operation. A vein for both donor and recipient should be used, anastomosing the distal part of the donor's vein with the proximal part of the external jugular of the recipient. In this way the radial artery is saved and it is easier to find a donor. Obviously there may be cases in which it is advisable to use the radial artery of the donor, and transfusion will be very satisfactory; but, when possible, vein to vein should be used, always preferring the external jugular for the recipient.

79. **Correction of Nasal Deformity.**—The septum in Glogau's case was prepared as for submucous resection by applying a 20 per cent. cocain solution and a 1 to 5,000 epinephrin solution, with cotton pledgets to the Schneiderian membrane. The usual incision was then made on the right side, but the knife was carried right through the cartilage toward the mucous lining of the left side without, however, injuring the latter. The cartilage was then elevated from the mucous lining on the left side, and by means of a strong pair of scissors an incision was made at its upper and lower margins. The cartilage flap, covered by the mucous lining of the right side, was thus attached at its posterior part only. The nostrils were now plugged with a piece of cotton, and the back of the nose cleaned aseptically. A 0.5 per cent. cocain solution, containing a few drops of epinephrin, was then injected hypodermically at the middle of the nose toward the tip. A transverse incision of about 15 mm. was then made at the lower end of the nasal bones. Through this incision, by means of a knife, the subcutaneous tissue was separated along the back of the nose down to the tip. A sharp spoon was then introduced into this pocket and the cartilage at the tip of the nose curetted. The external wound was then covered by a piece of gauze. The cartilaginous flap was now severed from its posterior attachment and put into a physiologic salt solution. By means of a Bier's skin grafting knife, the superficial epithelial layers of the mucosa were then removed, and the cartilage, covered by its perichondrium, shaped by means of a pair of scissors to fit into the deformity. The cartilage was then inserted into the deformity, and the transverse incision closed. The wound was covered by a small piece of iodoform gauze and adhesive plaster. The mucous lining over the bony part of the deviated septum was then elevated on both sides, and the bony deviation removed by submucous saws. The septal mucous lining of the left side remained intact, while on the right side there was a loss of substance corresponding to the piece of cartilage removed with its right-sided mucoperichondrium. The nasal cavities were then painted with a 10 per cent. oily solution of iodin and packed in the usual way. The intranasal packing was removed after forty-eight hours, and the dressing of the external wound was changed every day. After the fourth day

the ligature began to suppurate and the wound opened again. Healing by granulation took place. The inserted cartilage became permanently attached, and the deformity is now considered to be corrected.

St. Paul (Minn.) Medical Journal

November, XIV, No. 11, pp. 539-600

83 *Conservative Surgery in Purulent Infections of Kidney. A. Schwyzer, St. Paul.
84 Some Phases of Gastric and Duodenal Ulcer. M. M. Ghent, St. Paul.
85 Estimation of Blood-Pressure and Its Value from Diagnostic Standpoint. P. McKittrick, Eau Claire, Wis.

83. **Conservative Surgery.**—Schwyzer emphasizes the fact that the kidney parenchyma is not to be considered as free from bacteria even under normal conditions; and second, that the kidney substance has a good resistance against bacterial invasion. In operating on the kidney, in draining and otherwise handling it at and after operation, it is well to have these facts in mind.

Surgery, Gynecology and Obstetrics, Chicago

November, XV, No. 5, pp. 523-637

86 *Nephrectomy Without Drainage for Tuberculous Kidney. W. J. Mayo, Rochester, Minn.
87 *Case of Intracranial Division of Auditory Nerve for Persistent Aural Vertigo. C. H. Frazier, Philadelphia.
88 *Arthroplasty. J. M. Neff, Spokane, Wash.
89 *Osteo-Arthritis of Spine. F. D. Dickson, Philadelphia, and A. H. O'Neal, Wayne, Pa.
90 *Experimental Study of Placenta Under Physiologic and Pathologic Conditions (Ferments: "Vital" Staining). R. T. Frank, New York.
91 *Unsuccessful Surgery in Disorders of Gall-Ducts, Together with Consideration of Naunyn's Cholangiolitis. A. G. Gerster, New York.
92 Case of Pseudohermaphroditism. L. A. Greensfelder and L. C. Gatewood, Chicago.
93 Report of Exophthalmic Goiter Based on Experience of Members of the Chicago Surgical Society. W. Fuller, Chicago.
94 *Concerning Function of Corpus Luteum and Some Allied Problems. G. F. Dick and A. H. Curtis, Chicago.
95 Chorio-Epithelioma of Testicle. C. B. Keenan, Montreal.
96 Technical Points in Prostatic Enucleation. J. B. Squier, New York.
97 Roentgen-Ray in Gynecology. R. L. Dickinson, Brooklyn.
98 Spinal Anesthesia, with Report of Surgical Clinics. W. W. Babcock, Philadelphia.
99 Rhinophyma. J. C. Wood, Cleveland.

86. **Nephrectomy Without Drainage for Tuberculous Kidney.**—Mayo emphasizes that every effort should be made to remove the tuberculous kidney without the escape of its contents, and to secure this result an adequate incision is essential. The patient is placed on the sound side with a considerable degree of elevation of the loin. A vertical cut frees the twelfth rib from its posterior attachments and a long transverse incision mobilizes the lower wall of the thorax. In this manner a large kidney can be removed with ease. In some instances tuberculous material will have escaped spontaneously into the perirenal tissues before operation, and in such cases it will not be possible to remove the organ without distributing more or less of the tuberculous infection throughout the cavity of the wound. It is in these cases particularly that drainage has resulted so unfortunately and, Mayo believes, has been an unnecessary procedure. The stump of the ureter is a source of possible infection in the wound, and many surgeons either remove the kidney and ureter completely at the primary operation, or they suture the stump of the ureter to the skin for the protection of the wound. For a number of years it has been Mayo's practice to inject 10 to 20 minims of phenol (liquid 95 per cent.) into the ureter. This is distributed down through the lumen, and a ureter thus treated will rarely give trouble later. He is convinced that in draining these cases they made a mixed infection possible which was responsible for many of the postoperative conditions. Experience has taught that drainage following operations for tuberculous lesions within the abdomen is unnecessary and usually followed by sinus and fistula; also that draining the cavity from which a tuberculous kidney has been removed gives rise to complications which delay or prevent healing, and which may lead to the death of the patient some months later.

87. **Division of Auditory Nerve for Aural Vertigo.**—In this case the incision was made as for a unilateral suboccipital craniectomy. While the operation was followed by only partial relief, Frazier's experience with this operation and with many others in the posterior fossa encourages him to believe that this means of relief should be resorted to more frequently in the persistent and intractable forms of aural tinnitus and vertigo. Before the operation is undertaken, however, one should determine by every means of precision whether the case falls in the category for which this form of treatment is especially applicable.

88. **Arthroplasty.**—Neff reviews the history of arthroplasty, details the embryologic basis on which the operation is performed, the principles involved, the indications and contraindications for its performance, a consideration of the special joints, and then reports three cases, two of ankylosis of the knee and one of the elbow, in which he performed the operation successfully.

89. **Osteo-Arthritis of Spine.**—In diagnosing disease of the abdominal viscera the authors state that no examination is complete without a careful inquiry into the condition of the spinal cord and spinal column, including roentgenography.

90. **Experimental Study of Placenta.**—The evidence obtained by Frank in his investigation favors the view that the placenta is a passive organ for exchange, rather than an active organ of metabolism.

91. **Unsuccessful Surgery of Gall-Ducts.**—Gerster opens and drains every dilated common duct. He says that palpation should follow, not precede, incision of common duct. An inflamed, thickened, adherent or shrunken gall-bladder should be removed. All cicatricial deposits in gall-bladder or in cystic duct justify removal of gall-bladder. The presence of many small stones, even though the cystic duct is patulous, indicates that the gall-bladder should be removed. The presence of a damaged gall-bladder is not an aid, but an impediment to exposure of the common duct. Absence of the gall-bladder does not constitute an important adverse factor in the subsequent exposure of the common duct.

94. **Function of Corpus Luteum.**—The authors' results support the claim of Fraenkel that the corpus luteum is apparently essential for the development of the fetus during the early part of pregnancy. Attempts to produce an anticorpus-luteum serum according to Beebe's method were unsuccessful. Autotransplantation of ovaries yielded success in a rather small percentage of cases. Homotransplantation was considerably less successful. Removal of both ovaries failed to cause either adrenal hypertrophy or microscopic evidence of increased physiologic activity of the adrenals. Attempts to produce experimental rickets by means of transplantation of ovaries were unsuccessful.

FOREIGN

Titles marked with an asterisk (*) are abstracted below. Single case reports and trials of new drugs are usually omitted.

British Medical Journal, London

October 26, II, No. 2704, pp. 1089-1172

1 *Passing of Morbid Anatomy. J. F. Goodhart.
2 Pellagra in British Islands. L. W. Sambon and A. J. Chalmers.
3 Mitral Stenosis: Peripheral Emboli Causing Partial Monoplegia with Symptoms Simulating Cerebral Embolism. G. G. Alderson.
4 *Sugar in Cerebrospinal Fluid from Cases of Meningitis. F. H. Jacob.
5 Anemia of Ankylostomiasis. W. Nicoll.
6 Flies and Other Insects as Carriers of Infection. W. Nicoll.
7 Opsonic Index in Plague Vaccination. R. St. J. Brooks.
8 Destruction of Alkaloids by Emulsions of Body Tissues. A. J. Clark.
9 *Experimental Purpura. E. M. Cowell.
10 *Operative Treatment of Fractures, with Special Reference to Use of Intramedullary Pegs. E. W. H. Groves.
11 Acute and Subacute Lesions Induced in Spinal Cord by Infection of Its Lymph System. D. Orr and R. G. Rows.
12 Results of Treatment of Inflammatory Disease of Uterine Appendages. W. S. A. Griffith and C. Martin.
13 Chorio-Angioma of Placenta. R. W. Johnstone.
14 Rupture of Uterus in Connection with Case of Concealed Accidental Hemorrhage. D. Shannon.
15 Excretion of Creatin in Pregnancy and Toxemias of Pregnancy. J. P. Hedley.
16 *Rashes Occurring During Puerperium. J. Byers.
17 Some Developmental Errors of Puberty. W. E. Fothergill.
18 Etiology of Eclampsia. J. W. Ballantyne, J. H. Teacher and W. Smyly.
19 Treatment of Chronic Suppurative Ethmoiditis. L. Hajek and H. L. Lack.

1. See also *The Lancet*, October 26.

4. Sugar in Cerebrospinal Fluid from Cases of Meningitis.—There is in normal cerebrospinal fluid a chemical substance which reduces Fehling's solution, and this is absent in some cases of meningitis and present in others. There appears in the literature of the subject considerable confusion as to the cases in which it is present or absent, and considerable uncertainty as to its value. Jacob's experience, based on only a small number of cases, has led him to a definite conclusion on this subject, and he considers such examination to be of definite value. The method adopted is to boil together equal portions of cerebrospinal fluid and Fehling's solution in a narrow test tube and allow it to rest in a sloping position. In the course of an hour there will be a marked yellow deposit forming a band on the lower side of the tube, and with a little practice one can form a fairly accurate opinion as to whether such band is normal in amount or diminished; where sugar is absent no deposit will occur.

Jacob's results are as follows: In nine cases of tuberculous meningitis sugar was present in apparently normal amount in one case; was present in diminished amount in seven cases; was present in markedly diminished amount in one case; this was taken only two hours before death. In seven cases of pneumococcus meningitis sugar was absent in every case. In three cases of streptococcus meningitis sugar was absent in every case. In nine cases of cerebrospinal meningitis sugar was absent in two cases and present in diminished amount in seven cases. In seven cases of poliomyelitis sugar was normal in amount in one case and slightly diminished in six cases. In three cases of mixed septic meningitis, secondary to middle-ear disease, sugar was absent in all three cases. His conclusions are: In pyogenic meningitis, pneumococcus, streptococcus and mixed infection, sugar is invariably absent. In cerebrospinal meningitis sugar is absent in the acute stage, but may return in some degree as the infection recedes. In tuberculous meningitis sugar is present, except in very rare cases shortly before death, in which stage difficulty of diagnosis rarely exists. In poliomyelitis sugar is present.

9. Experimental Purpura.—As regards the production of experimental purpura, Cowell's results have been negative. He believes that the oft-quoted positive experiments must, at any rate, not be accepted at present. It is doubtful whether benzol has any effect on the blood-platelets. Although the lytic body at work in purpura is undoubtedly allied to a hemolysin, yet its action seems to be different, since in two fatal cases of purpura neonatorum Cowell has been able to microscope the organs without finding traces of free iron.

10. Operative Treatment of Fractures.—In certain cases, Groves says, the method of using an intramedullary peg has great advantages over all others. There are two different methods by which the pegs may be introduced into the bone. The first kind of peg is comparatively short, *i. e.*, about 24 cm. in length. It has a fixed crosspiece, transfixing its center, which keeps the peg from slipping too far into one end or other of the hollow bone. One end of the peg is fitted into one fragment of the broken bone. Then the other fragment is made to engage the projecting end of the peg, and by bringing the bone fragments into line with one another the muscular tension pulls the ends of the bone together over the enclosed peg, which serves thus to keep the fragments in exact apposition. This type of peg can only be used in those cases in which the broken bone fragments are easily separated from one another. When it is in position, owing to its shortness, it does not exercise much influence in maintaining the straight axis of the bone.

In the class of fractures in which operation is demanded most imperatively, a peg like the one described cannot be employed, simply because in these neglected or malunited cases it is impossible to separate the broken ends of the bone sufficiently to insert the peg. For these cases Groves has used pegs which are drawn into their place by means of wire traction. Each of these pegs is about 4 to 7 cm. long, and is perforated in its center by a hole transverse to its long axis. Along opposite sides of the peg run grooves in its whole length, and into these grooves the ends of the transverse hole open. The size of the hole and groove is one which easily takes a fine flexible steel wire, which, when threaded through the transverse hole, lies snugly in the grooves, so that the whole peg can be slipped into one fragment of the bone, the other fragment brought into apposition, and then, by traction on the wire, the peg is pulled up into position, so that one-half lies in one fragment and the other in the other. As regards the thickness of these pegs, Groves has a set of thirteen sizes, varying from ⅛ to ½ inch, each size differing from the other by 1/32 inch, and also a set of drills for preparing the bone ends. Each drill makes a hole, into which the corresponding peg will slip easily. The object of drilling the bone should simply be to clear away any rough, outstanding spicules of bone, and not to actually enlarge the natural marrow cavity. It is unnecessary to make the pegs fit very tightly, and the less drilling that is done the better.

As regards the method of traction on the wire, in most cases it is quite sufficient to pull on the wire ends, which are rolled round pairs of forceps. But if one has to work at the bottom of a deep wound, which makes it difficult to carry this out, the traction may be made by an instrument which winds the wire ends on to two revolving shafts, at considerable mechanical advantage.

Groves has used intramedullary pegs made of various materials. In comparing the merits of various materials, e. g., bone, steel and aluminum, he states that the metal pegs are much the best for animal experiments, because those made of bone or ivory are very brittle, and are liable to be broken. Magnesium has a very definite and distinct characteristic when used for the pegging of bones. It is absorbed within a few weeks, and in the process of its absorption it greatly stimulates the callus production and the ossification of the same. Of the other forms of absorbable bone-pegs Groves has not yet found any which give good results with animal experiments. He has used decalcified bone, horn, catgut, gelatin hardened with formol, and fibrin round an axis of catgut. Of these horn is the best, but in all cases the softening takes place too early, that is to say, before any organic fixation has occurred, and then complete displacement takes place.

16. Rashes in Puerperium.—Byers is of the opinion that scarlatina is rarely encountered during the puerperium. When it does occur during the puerperal period it is, as a rule, a mild disease, that is, with the use of modern aseptic and antiseptic precautions. What has been called "puerperal scarlatina" is almost always a form of septic infection with a rash resembling the eruption seen in true scarlatina. From a person ill of scarlatina there may be conveyed to a lying-in woman either: (a) A true scarlatina; or (b) septicemia, arising from the secondary septic changes which are apt to take place in the throat, etc., in scarlatina. The former (a) occurrence seems to be rare, while the latter (b) should be avoided by modern aseptic and antiseptic precautions.

Journal of Obstetrics and Gynecology of British Empire, London

September, XXII, No. 3, pp. 119-190

20 Dusée: His Forceps and His Contemporaries. A. Doran.
21 Ventrofixation: Its History, Technic, Uses and Dangers, More Particularly as Regards Subsequent Pregnancies. W. M. Fergusson.
22 *Early Case of Chorionepithelioma Uteri. W. Thompson and M. J. Stewart.

22. Early Case of Chorio-Epithelioma Uteri.—This case is chiefly of interest from the clinical point of view, being one in which a chorio-epitheliomatous uterus was successfully removed within five weeks of the passage of a hydatidiform mole. Fourteen months later, the patient is alive and well, with nothing to suggest either recurrence or dissemination. Microscopically the specimen was a typical chorionepithelioma malignum with a preponderance of cells of the intermediate type. There was a striking preponderance in the tumor of intermediate or wandering cells, with a comparatively scanty formation of syncytium and Langhans' cells. It is noted, however, that masses of the latter were found in some of the sinuses of the myometrium, and that this, according to Schmauch, is clear evidence of the malignancy of the growth. Both ovaries were the seat of lutein cyst-formation, a phe-

nomenon which has frequently been observed in cases of chorionepithelioma and hydatidiform mole, and which is regarded by some observers as a possible etiologic factor.

Journal of Tropical Medicine and Hygiene, London

October 15, XV, No. 20, pp. 305-320

23 Pellagra; "Sandfly Protozoon" Versus "Zeist Theory." L. Nicholls.
24 Experiments with Culture Media Suitable for Use in Tropical Countries. C. Wellman and A. Hand.
25 Pigmented Maculae on Body. R. H. Castor.

Lancet, London

October 26, II, No. 4652, pp. 1129-1198

26 Passing of Morbid Anatomy. J. F. Goodhart.
27 Mental Disorders. G. H. Savage.
28 Industrial Mercurial Poisoning as Seen in Felt-Hat Makers. F. E. Tylecote.
29 *Operative Treatment of Fractures. A. J. Walton.
30 Reflections on Gastrojejunostomy. J. O'Conor.
31 *Case of Localized Intracorpuscular Sulphemoglobinemia. H. Davis.
32 Case of Myxedema. R. S. Novis.
33 *Practical Use of Vaccine Treatment in Pulmonary Tuberculosis. B. Hudson.
34 Vaccine Treatment of Acute Pneumococcal Tonsilitis. S. P. Shivdas.
35 Unusual Pneumococcal Infection. L. Bathurst.

29. Operative Treatment of Fractures.—Some of the essential features of using plates are emphasized by Walton. He says that in fixing the plate there are many errors to be guarded against, and although the means of avoiding these errors constitute the most elementary rules of carpentry or practical mechanics, they are not uncommonly made when these arts are applied to surgery, and are responsible for a considerable proportion of the poor results. The rules to be observed are: At least three screws must be inserted, preferably two on either side of the fracture. If only one be used on either side the plate acts as a perfect hinge and allows the fragments to swing round. The plate must be strong enough not to bend or crack. The drill must be chosen to fit the screw; It should be as wide as the shank only, and not as wide as the thread. The screws must be short and with the thread cut right up to the head, otherwise the threaded portion will pass through the compact bone and be loose in the medullary cavity, the screw then acting only as a nail, which will be loose and the union thus unstable. The screw should simply be inserted until slight resistance to rotation is felt. If the hole be correctly drilled the screw will then be firm home. If rotated further, the thread of the screw or the bone will only be torn out and the screw thus lie loose in the hole.

When wiring is resorted to, two loops at least must be used, and the ends firmly twisted together with forceps. Here again there are several simple mechanical points which it is important to observe. A slight groove should be cut for the wire to prevent it slipping. It need not completely encircle the bone. The loops of wire should be placed either at right angles to the shaft of the bone or somewhat obliquely, that is, in such a manner that they tend to be more parallel with the line of fracture, for the tendency of these fragments is to override one another owing to the contraction of the muscles. With this obliquity such a movement would be associated with a closer approximation of the ends, while if placed with the obliquity in the opposite direction the fragments would readily separate and override. In twisting the ends of the wire it is essential that the two pairs of forceps with which the ends of the wires are grasped be so held that each piece of wire makes the same angle with the vertical, otherwise one wire will alone be twisted round the other. Not only is the grip imperfect, but the twisted wire will also rotate on its long axis, and thus is almost certain to break.

Instead of a wire the ingenious instrument of Lambotte can be used. This is shaped like a piece of wire split in its long axis, so that on section it forms a semicircle. On the circumference a screw thread is cut. A loop is passed round the bone, and when the two ends are brought together so that their flattened surfaces are in apposition they together form a cylinder with a thread cut on its outer surface. A nut can then be screwed over them and the loop thus tightened to any degree. The ends can then be cut off level with the nut. The general subject of operative treatment of fractures is considered in detail.

31. Localized Intracorpuscular Sulphemoglobinemia.—The face of Davis' patient, a female, 27 years of age, instead of being of the normal pink tint, was stained a deep slate blue, almost a blue-black. This hue prevailed all over the face and scalp and over the exposed part of the neck, but it could not be observed anywhere else, except at the bases of the fingernails. The bases of the toe-nails were of the normal color. The mucous membranes were unstained. On the face the color was most marked over the nose, but it was quite obvious in the sclerotics; the cheeks and forehead were also affected, but the ears to a slightly less degree than other parts. The color could not be dispersed by pressure. Inquiry into the history of the patient elicited the fact that she had had measles when a child. She had not had scarlet fever, pneumonia, bronchitis, rheumatism or chorea. There was no history of the application of carbolic acid preparations or of the ingestion of silver compounds at any time. Her face had assumed its present peculiar tint eleven years previously, at the age of 16, without any apparent cause, and had not changed since that time. Otherwise the patient was well and physical examination was negative.

In blood taken from the ear the characteristic absorption band of sulphemoglobinemia in the red end of the spectrum was present. A specimen from the finger was normal. The two facts that the peculiar color of the skin is so definitely localized, and, further, that the spectroscopic characters of the blood vary according to the situation from which it is taken, combine to make this case, Davis believes, quite unique. The depth of color varies considerably from time to time, almost from minute to minute. Again, after having been out in the grounds for an hour or two on a rather chilly day the fingers, in addition to the bed of the nails, have been seen to be obviously affected. Lately, too, the pigmentation has shown a tendency to spread, and it seems probable that the curious localization will disappear and that ultimately the discoloration will become obvious all over the body. Simultaneously with the deepening of the color and its spread it is interesting to notice that the patient has complained of not feeling so well.

33. Vaccine Treatment of Pulmonary Tuberculosis.—In certain selected cases of pulmonary tuberculosis, Hudson believes that a course of vaccine treatment is certainly of great benefit. There is, however, always a large amount of uncertainty, owing to the difficulty of isolating the causal organism; but even if the vaccine does no good, it at any rate never seems to do any permanent damage, and therefore is always worth trying. The treatment may be used in conjunction with tuberculin. Hudson emphasizes that any injection or other treatment is only an adjunct, and that the general hygiene, open-air, climatic and tonic treatment, systematic rest and good feeling should be always strictly enforced.

Sei-I-Kwai Medical Journal, Tokyo

October, XXXI, No. 10, pp. 231-240

36 Acute Appendicitis. Y. Takaki.

Bulletin de l'Académie de Médecine, Paris

October 6, LXVIII, No. 33, pp. 155-246

37 *Salvarsan in Local Treatment of Vincent's Angina. C. Achard.
38 *Vaccination Against Typhoid at Avignon. H. Vincent.
39 Resection of Six Feet of Intestine Connected with Mesentery Adherent to Tip of Infected Appendix. (Forme d'appendicite non encore décrite.) J. Boeckel.

37. Local Treatment of Vincent's Angina with Salvarsan.—Achard's article was summarized in the Paris Letter, p. 1729.

38. Vaccination Against Typhoid.—Vincent states that in an epidemic of typhoid in the barracks at Avignon this summer there were 155 cases with twenty-one deaths among 687 soldiers who were not vaccinated, while among the 1,366 soldiers who had submitted to vaccination, not a single case developed and no gastro-intestinal disturbances of any kind were observed. This does not include the civil population in which the epidemic prevailed widely, 644 cases having been reported in a population of 49,000. The number was probably more than twice this in reality; the mortality was sixty-four. The epidemic is stated to have been beyond question waterborne.

Journal de Médecine de Bordeaux

October 6, XLII, No. 40, pp. 629-644

40 Muscular Disease Attributed to Trauma. (De la conduite des experts en présence des myélopathies systématisées attribuées à un traumatisme.) H. Verger.

Lyon Médical, Lyons

October 13, XLIV, No. 41, pp. 589-636

41 Familial Hemophilia; Failure of Autoserotherapy. F. Leclerc and J. Challer.

Presse Médicale, Paris

October 19, XX, No. 85, pp. 853-864

42 *Contralateral Nerve Anastomosis from Experimental and Clinical Standpoint. D. Maragliano.
43 Spontaneous Pneumothorax in Tuberculosis. F. Dumarest and C. Murard.
44 The General Biologic Laws of Diuresis. A. Martinet.

42. Contralateral Nerve Grafting.—Maragliano describes the technic with which he grafted the left sciatic nerve on the right, in dogs, passing it through a tunnel under the skin. After several months the gait became apparently normal. In 1909 he applied the same technic on a child of 2 with spinal paralysis following epidemic poliomyelitis. He isolated the femoral nerve and its branches, a little above the knee, and severed the right femoral nerve 1 cm. above Poupart's ligament after electric tests had shown the absence of all reaction. He then drew the left femoral nerve through a tunnel and sutured it to the peripheral stump of the right femoral nerve. Improvement gradually followed and by the eighteenth month the child was able to stretch his leg while the left side showed no loss of functioning. The right leg is still too weak to support the weight of the body, but the progress realized to date promises that this will be possible in a few months. The results attained are the more remarkable as the nerve branch utilized was of smaller caliber than the paralyzed nerve trunk to which it was to bring new life. Equally good results were obtained in two other cases of the kind, and he thinks the sciatic nerve is even better adapted to this contralateral grafting than the femoral.

Revue de Médecine, Paris

October, XXXII, No. 10, pp. 761-864

45 Tuberculous Nature of Ascites with Cirrhosis of the Liver. G. Roque and V. Cordier. To be continued.
46 *Classification of Acute Forms of Tuberculosis. H. Gougerot.
47 *Nitrogen Metabolism in the Tuberculous. (Les échanges azotés chez les phthisiques.) H. Labbé and G. Vitry.
48 *Artificial Pleurisy in Treatment of Pulmonary Tuberculosis. I. Cecikas.
49 Recovery from Tuberculous Meningitis. (Méningite tuberculeuse guérie.) E. Cottin.

46. Acute Forms of Tuberculosis.—Gougerot refers in particular to the form of acute tuberculosis characterized by the presence of tubercle bacilli in the blood and the absence of definite tubercle formation. The clinical symptoms are those of typhoid, but the daily temperature variation is apt to be greater, the Widal reaction is negative, and there are no rose spots. In case of typhoid without rose spots, this "typhobacillosis," as Landouzy calls it, should be suspected and the blood examined for tubercle bacilli and tested by animal inoculation.

47. Nitrogen Elimination in Tuberculosis.—Labbé and Vitry state that the total nitrogen excreted in the urine of tuberculous patients is lower than normal; it averages 8 gm. in twenty-four hours. The urinary coefficient is lower than normal, which shows that more nitrogen than normal is being excreted in some other form than in urea. This is verified by studying the purins and the ammonia which are both excreted in somewhat larger quantity than normal. The increase in purins is accounted for by the fact that the abnormal destruction of the patient's own tissues sets free an increased amount of nucleins. All these urinary findings increase in degree with the progress of the disease.

48. Artificial Pleurisy in Treatment of Pulmonary Tuberculosis.—Cecikas reports two tuberculosis cases in which he produced artificial pleurisy by injection of turpentine, with resulting marked improvement in both instances. He believes that the products of the inflammation thus elicited are antagonistic to the tubercle bacillus, and that the good results obtained with artificial pneumothorax are due to this cause and not to the compression of the lung.

Semaine Médicale, Paris

October 23, XXXII, No. 43, pp. 505-516

50 The Esmarch Bandage. (Ce qu'il faut penser des dangers de la bande d'Esmarch.) F. Lejars.

Beiträge zur Geburtshilfe und Gynaekologie, Leipsic

XVII, No. 3, pp. 287-398. Last indexed July 13, p. 150

51 The Obstetrician-Crab. (Ein Namensvetter im Tierreich.) E. A. Kehrer.
52 Deformity from Lack of Amniotic Fluid. (Ueber Oligohydramnie mit konsekutiver Verunstaltung der menschlichen Frucht.) W. Biber.
53 *Pelvic Tuberculosis in Women. (Genital- und Peritonealtuberkulose mit bes. Berücks. von 82 Fällen der Heidelberger Universitäts-Frauenklinik.) S. Wolff.
54 Blood-Pressure and Prognosis with Gynecologic Operations. A. Gross.
55 Osteomalacia Improved by Porro Operation; One Case. F. Suzuki.
56 *Rupture of Uterus After Cesarean Section. A. Wyss.
57 Case of Primary Chorionepithelioma of the Ovary. (Zur Frage des Epithelioma chorioectodermale.) R. Klotz.

53. Genital and Peritoneal Tuberculosis.—Wolff gives ten four-page tables showing the details of eighty-two cases of genital or peritoneal tuberculosis in women. In 68.3 per cent. both the genital organs and peritoneum were involved. In only 7.3 per cent. were both oviducts alone the seat of the tuberculous process, and in 2.4 per cent. one tube alone. No instance was found of a tuberculous process in the ovaries alone, but this occurred in the uterus in 3.6 per cent. Five of the eighty-two were girls under 20 but most of the patients were between 20 and 35. Only 37 per cent. of the total eighty-two women had normal menstruation. In thirty-one cases the diagnosis had been erroneous. In the fifty-five operative cases, 75 per cent. of the patients were living two years later and only 52 per cent. of the twenty-one treated by conservative measures alone, while only the mildest forms of the tuberculosis were given conservative treatment. The final outcome with operative treatment is so satisfactory that it imposes the necessity for surgical measures in every well established case of genital or peritoneal tuberculosis in women. The operative measures should be supplemented by the usual general ones, and Wolff agrees with Franqué that there is no sense in abstaining from the curative measures on the tuberculous pelvic organs just because this does not cure tuberculous processes elsewhere in the organism. The operation relieves the patient from her local disturbances in the pelvis and thus accomplishes at one stroke what may require years under conservative measures if ever attainable by this means.

56. Rupture of Uterus after Cesarean Section.—Wyss reports two cases of this mishap during a pregnancy following delivery by cesarean section, and compares them with forty-two similar cases from the literature. In eight cases on record the old cicatrix parted; in nine others a fistula developed; in three the abdominal walls ruptured, and in eight the cesarean section wound burst open a few days after it had been sutured. In two other cases in Wyss' experience a woman died from paralysis of the bowel following the bursting open of the laparotomy wound. The various experiences related emphasize the necessity for limiting cesarean section to the cases in which it is strictly needed, and, where it is indispensable, the necessity for applying at the same time some operative measure to prevent further conception. After a woman has had cesarean section done, she should go to a maternity during the last weeks of following pregnancies so as to be under constant medical supervision.

Berliner klinische Wochenschrift

October 21, XLIX, No. 43, pp. 2017-2064

58 Therapeutic Action of Metals in Cancer. (Wirkung der Metalle auf Krebs.) H. R. Gaylord (Buffalo).
59 Non-Inflammatory Necrosis of the Liver from Venous Stasis. (Ueber die bei schwerer venöser Stauung auftretenden nichtentzündlichen Lebernekrosen mit Icterus.) H. Oertel (New York).
60 *Principles of Organotherapy. A. Münzer.
61 *The Predisposition to Tuberculosis. (Der Thorax phthisicus und die tuberkulöse Disposition.) C. Hart.
62 Pathology of the Diaphragm. F. Buttersack.
63 *Intermittent Claudication. (Dysbasia arteriosclerotica und Plattfuss.) Brandenstein. (Fall von Angiosklerose der Darmarterein mit intermittierendem Hinken.) G. A. Friedmann (New York).

64 Lead in Lithographs. (Sind bleihaltige Abziehbilder giftig?) T. Weyl.
65 Little Influence from Roentgen-Ray Exposures on Hemolytic Complement of Guinea-Pig Serum. E. Fränkel.
66 Serodiagnosis of Staphylococcus Diseases. G. Wolfsohn.
67 Technic for Obtaining Blood for Laboratory Examination. W. Lintz.
68 Nomenclature of Salts. R. Sodemann.

60. **Principles for Successful Organotherapy.**—Münzer comments on the well established fact that the ductless glands seem to work in pairs, one of each pair stimulating and the other checking certain functions. By operative removal of the gland that does the checking, the stimulating gland is left in full control and the function of which it has charge receives only the stimulating activation. The logical conclusion is therefore that before utilizing glands for organotherapy their antagonists should be removed. He cites as an example Cushing's recent research on carbohydrate tolerance before and after removal or exclusion of the posterior lobe of the hypophysis cerebri. His experiments all demonstrate that the posterior lobe has an inhibiting action on the oxidation of carbohydrates and is thus an antagonist to the pancreas which, we know, is concerned in this oxidation of carbohydrates. For organotherapy, therefore, a pancreas should be used which has been previously activated by removal of its antagonist, the posterior lobe of the hypophysis. Only in this way will organotherapy accomplish what has been hoped from it, and its use be extended.

61. **Predisposition to Tuberculosis.**—Hart discusses the constitutional and acquired factors liable to induce a predisposition to apical disease, especially the mechanical injury from lack of proportion between the anatomy and the functioning of the upper aperture of the thorax. He lays special stress on the prophylactic influencing of the growing thorax in the young. This would render Freund's chondrotomy unnecessary except in the cases of pure age ossification; here it is of great importance and benefit.

63. **Flat-Foot with Intermittent Claudication.**—Brandenstein reports three cases of this combination in men in the forties. The disturbance from the flat-foot had only been aggravated by insoles, as they impeded the circulation in the foot still more. In these as in a number of other cases not reported here, great benefit followed application of measures to act on the circulation alone, superheated air, potassium iodid and heart tonics. Objectively no modifications could be detected, but the patients were relieved of almost all their disturbances, even in the cases free from a history of syphilis. The trouble in this combination of arteriosclerotic intermittent claudication and flat-foot is generally attributed to the latter alone, and the more serious vascular affection is overlooked or regarded as of no moment, so Brandenstein lays special stress on the necessity for being on the lookout for it in persons with flat-foot who are no longer young.

Correspondenz-Blatt für Schweizer Aerzte, Basel

October 20, XLII, No. 30, pp. 1129-1176

69 *Exophthalmic Goiter. (Morbus Basedow.) A. Oswald.

69. **Nature of Exophthalmic Goiter.**—Oswald presents a summary of what has been done recently in the line of research and theory on the subject of Basedow's disease, and crystallizes out of it the conception that exophthalmic goiter is the result of both a thyroid and a nervous factor. The thyroid secretion acts on both the sympathetic and the cerebrospinal nerve systems. This has been abundantly proved by animal experimentation, to which Oswald has some unpublished experiences to contribute. Increased secretion in the thyroid has no clinically appreciable injurious influence on the two nerve systems when they are sound. But when one or the other of the two great nerve systems is irritable or diseased, then the products of excessive thyroid functioning irritate the irritable nerve system; if this happens to be the sympathetic nerve system, then this in turn stimulates the thyroid and heart to extra functioning. A vicious circle is thus set up, constantly aggravating the morbid conditions, and we have the clinical picture of exophtmalmic goiter. If the thyroid gland is then removed, this puts an end to this secondary retro-active morbid influence magnifying the irritation from the original cause. The sympathetic nerve system is thus freed from the multiplier of its irritation, and it gradually grows less irritable under the rest and hygiene which are an essential adjuvant in operative treatment of exophthalmic goiter. This conception of the nature of Basedow's disease explains why thyroid and iodin treatment do harm in this condition. They both have an injurious influence on the nervous system, the first directly, the second indirectly. Exophthalmic goiter developing after infectious diseases is due to the same mechanism; it does not occur except in persons with predisposed nervous systems. Endemic goiter very rarely passes into the Basedow type; the predisposition on the part of the nervous system seems to be exceptional in the regions where simple goiter is endemic. Without the predisposition on the part of the nervous system it is impossible to elicit exophthalmic goiter by feeding thyroid extract. None of the changes found in the goitrous thyroid is characteristic for the Basedow type. The most recent development in the Basedow question is the cooperation of the thymus in the process. Oswald regards the thymus as merely a further aggravating multiplier of the original morbid condition. When there is a persisting thymus, the individual is in double danger from his Basedow; there is a general constitutional anomaly which manifests itself in the persisting large thymus and possibly hypertrophy of the lymphatic apparatus. This indicates low resisting powers; the organism is less resistant to internal and external injurious influences, especially those affecting the heart. Removal of the thymus, by thus abolishing one of the multiplying factors, helps to break up the vicious circle, and this alone has been known to cure the exophthalmic goiter in some cases. He states that a large persisting thymus is always found in those who die of exophthalmic goiter or during operations on the thyroid.

Deutsche medizinische Wochenschrift, Berlin

October 17, XXXVIII, No. 42, pp. 1961-2008

70 *Dietetic Treatment of Polyuria. (Ueber die Diätbehandlung des Diabetes insipidus und ähnlicher Polyurien.) H. Strauss.
71 Nature of Tuberculin Reaction. (Wesen der Tuberkulinreaktion.) F. Meyer and K. E. F. Schmitz.
72 *Heart Disturbances with Endemic Goiter. (Die Herzstörungen bei endemischem Kropf.) J. Bauer.
73 *Improved Apparatus for Recording Venous Pulse. (Neuer Apparat zur Venenpulsaufnahme.) Henkel.
74 *Changes in the Pancreas with Alcoholism. M. Lissauer.
75 *Changes in Urine with Albuminuria Induced by Position. (Lordotische Albuminurie und Titrationsazidität des Urins.) E. Fränkel.
76 *Analysis of the Urine. (Zur Harnanalyse.) P. Bergell.
77 Percussion in Diagnosis of Fracture of the Skull. (Die perkutorische Diagnose von Schädelbrüchen.) W. Goebel.
78 *Treatment of Traumatic Gangrene of Leg or Arm. E. G. Liek.
79 Scleroma in Prussia. (Neue Sklerom fälle aus Ostpreussen.) P. H. Gerber.

70. **Dietetic Treatment of Polyuria.**—Strauss has long been calling attention to a special feature of diabetes insipidus, namely, the inability of the kidneys to produce urine of a concentration corresponding to the intake of solids. The kidney is able to eliminate the solid elements only by washing them out in an excessively large output of urine. In doing this the tissues get dried out. This explains the benefit from a salt-poor diet in diabetes insipidus in some cases. When restriction in the amount of salt in the food fails to influence the polyuria, then the amount of fluid taken should be restricted at the same time. Restriction of both salt and fluid is not necessary unless the salt-poor diet alone fails to have the desired effect. He comments on the excessive drinking of fluid in many cases of diabetes insipidus as a bad habit; restriction of the intake of fluid has a good educational influence. The thirst can be relieved sometimes with fruits or rinsing the mouth with cold water or by sipping a little lemonade or carbonated water. The absence of phenomena on the part of the heart and the comparatively normal blood-pressure show, he says, that diabetes insipidus is not so very serious. The injury of the cardiovascular system from transporting such large amounts of fluids is not so severe as some believe. The intake of fluid in the evening should be reduced to avoid the interference with sleep. He thinks that the protein intake can be reduced to 60 or 70 gm. daily. When a functional neurosis or arteriosclerosis is involved, meat had better be avoided.

72. **Heart Disturbances with Goiter.**—Bauer writes from Innsbruck, where goiter is endemic, to say that heart disturbances with simple goiter are common there but they differ from the usual forms of goiter heart. The main findings are an accidental systolic murmur, more pronounced over the pulmonary artery, an accentuated second sound and slight enlargement of the heart dulness toward the left. The apex beat is normal, the pulse not accelerated and there is not much subjective disturbance. He regards these heart findings as due to thyroid intoxication, and calls them the torpid form in contrast to Kraus' overexcitable type of thyroid heart.

73. **Venous Pulse Curve.**—Henkel has devised a little apparatus which consists of a stand with three legs holding on the vein the pad connected with the drum. The three legs of the stand are of hollow rubber and are held firm on the skin by vacuum action, the air being pumped out of them with a rubber bulb. The little tripod thus fits tight to the skin and moves with it, while the recording pad can be adjusted to determine the vein pulse without interfering with the arterial.

74. **Changes in the Pancreas in Alcoholism.**—Lissauer has found in twenty-four cases of gin liver that the pancreas showed more or less similar changes. His findings confirm those of Weichselbaum in twenty-seven similar cases. The importance of this "gin pancreas" is evident in the development of diabetes mellitus in persons addicted to liquor.

75. **Lordotic Albuminuria.**—Fränkel examined twenty-one children with spinal disease and found eight free from any trace of albuminuria, while it was evident in the others. In twenty-two other children with albuminuria he found only eight without some anomaly in the spine. Among other points learned from this research is that the total acidity increased in the children with albuminuria induced by lordosis, unless the children had been given beforehand a dose of 4 gm. sodium bicarbonate. It is possible, he says, that the elimination of albumin in these cases is due to abnormal production of acid. It might be wise to give an alkali occasionally in addition to hygiene and tonics to combat the constitutional weakness. Some of the children were pale and restless and complained of headache—all improving under the alkali. In one child the albuminuria followed a scarlet fever nephritis; this scarlatinal nephritis never showed any influence from the administration of the alkali.

76. **Test for Nitrogen in the Urine.**—Bergell gives the details of a technic which he has found very useful, simpler and more reliable than the Kjeldahl tests, for determination of the nitrogen in the urine. A quartz test-tube is required and in this the nitrogen is determined after calcining with calcium oxid.

78. **Treatment of Impending Gangrene of Extremities.**—Noesske reported in 1909 the excellent results of slitting the end of the finger down to the bone and applying a suction cup when the part was threatened with gangrene. By this means the stagnating venous blood was drawn out of the tissues and the arterial blood streamed in to take its place, thus restoring the circulation and warding off further trouble. Liek has applied the same principle in a number of cases, especially pedunculated flaps when gangrene seemed inevitable, but he never found it necessary to go to such extremes as the above, numerous minute incisions proving all that was necessary and healing without leaving disfigurement. This was particularly evident in a recent case in which a young man had had his right ear sliced nearly off. It was connected with only a bridge of skin 1.5 cm. wide. Liek sutured it in place but the ear was blue and cold until he made fifteen small incisions, both on the front and rear, radiating from the meatus. Each incision was 3 or 5 mm. long; at first they did not bleed but after a time drops of dark blood began to ooze out and the ear began to resume its natural tint. Gangrene was thus warded off and the ear healed in place. He did not apply the vacuum cup, and he thinks that even for the fingers these minute incisions might give equally good results as Noesske's single deep incision while there would be no resulting disfigurement or impairment of function. Liek urges exarticulation of the fingers as giving better results than the deformed stump left after serious injury of a finger. Workingmen are less incapacitated by being left with four fingers than with a stiff and contracted fifth finger after too zealous conservatism.

Deutsche Zeitschrift für Chirurgie, Leipsic

October, CXIX, Nos. 3-4, pp. 201-368

80 *Treatment of Glass-Blowers' Tumor. (Ueber operative Eingriffe bei der Pneumatocele der Parotis und des Ductus Stenonianus.) A. Narath.
81 *Surgery of the Heart. (Zur Chirurgie des Herzens.) A. Wagner.
82 Experimental Goiter. (Zur experimentellen Erzeugung der Struma.) J. Sasaki.
83 Changes in Pulse and Blood-Pressure with Pneumothorax. (Zur Kenntnis der Puls- und Blutdruckveränderungen beim Pneumothorax.) H. E. Walther.
84 Dislocations in the Foot. (Luxationen im Bereich des Mittelfusses.) K. Brockmann.
85 *Anthrax. (Der äussere Milzbrand des Menschen.) O. Heinemann.
86 Primary Cystic Enlargement of Common Bile Duct. (Zur Kasuistik der primären cystischen Erweiterung des Ductus choledochus.) J. Mayesima.
87 Artificial Common Bile Duct. (Experimentelle Versuche über künstliche Choledochusbildung durch einfaches Drainrohr.) L. Arnsperger and N. Kimura.

80. **Glass-Blower's Tumor.**—Narath comments on the errors in diagnosis of the tumor in the parotid gland which is an occupational affection in glass-blowers. In Liniger's case two physicians had ascribed the trouble to rupture of the buccal mucosa, but in this as in a personal case described and in all the others but one on record, there was no rupture; the air had merely forced its way through the outlet into the gland. The chronically stretched duct and gland never return to normal conditions and the workman may thus be partially if not totally incapacitated for glass-blowing unless some appliance can be worn which will compress from without the duct of Steno and thus prevent entrance of air during the blowing, or the condition can be corrected by an operation. Narath exposed the duct and dug it out of its natural opening into the mouth, carrying it farther along to another point where he implanted the mouth of the duct in the mucosa. This made the course of the duct slanting instead of direct, and a sort of valve action prevented entrance of air. The new mouth of the duct finally grew up with cicatricial tissue, preventing the outflow of saliva. A second operation was therefore necessary and Narath excised most of the parotid gland from without and thus put an end to the pneumatocele while sparing the muscles and nerves. He was impressed with the efficiency of his adjuvant injection directly into the gland of a caustic solution. It speedily destroyed the gland tissue and he thinks that direct injections of this kind through the natural outlet might be sufficient to cause the shriveling up of the gland without an operation. There would, however, be danger of importing infection from the mouth with this treatment, and the preferable technic, he suggests, would be to bring the mouth of the duct out through the cheek and then, when the wounds had healed, to proceed to the obliteration of the parotid gland with injections of the caustic zinc chlorid. He is waiting impatiently for an opportunity to try this method in the clinic after experimental research. In conclusion he suggests that possibly mere ligation of the duct might prove effectual.

81. **Surgery of the Heart.**—Wagner states that there are now 260 cases of operations on the heart on record with recovery of about 50 per cent. of the patients. The signs of injury of the heart from a stab or gunshot wound are the external wound, the abnormal murmurs, the spreading area of dulness, Rose's "heart tamponade" (strangulation of the heart from accumulation of blood in the pericardium), anemia and subjective phenomena such as precordial anguish, pain in the heart region, sense of oppression and dyspnea. Roentgenoscopy is seldom practicable in a case of serious injury of the heart. As the prospects are good for operative treatment up to the fourth hour, the importance of an early diagnosis is evident. But the most serious cases do not always present the severest symptoms. In a personal case described all the signs pointed to a stab wound of the heart and it was exposed by an operation but the heart proved to be intact, although blood had accumulated in and around the pericardium. The man would undoubt-

edly have recovered without the operation, and the case would then have gone on record as "recovery from a stab wound of the heart under conservative measures alone," when in reality there had been no wound in the heart.

85. **Anthrax.**—Heinemann has compiled 2,000 cases of malignant pustule and compares them with his own experience, his impression being that operative measures offer invariably the best prospects for a cure. The operation must consist in the most thorough excision of the entire diseased area. The assertions in regard to the harmfulness of this are based on false premises; only an incomplete operation can do harm; the complete can only benefit in the treatment of local anthrax. The mortality in Koch's 1,473 cases was 38.8 per cent., but the statistics brought down to date give a mortality of 5.8 per cent. in 2,255 cases. The entire material is tabulated under various headings, with a full bibliography.

Medizinische Klinik, Berlin

October 20, VIII, No. 42, pp. 1693-1730

88 Examination of Nervous System After Trauma. (Welche Vorsichtsmassregeln sind bei der Untersuchung des Nervensystems Unfallverletzter zur beobachten?) P. Schuster.
89 Examination of the Hearing. (Ueber Hörprüfung und ihre Verwertung in der amts- und sivilärztlichen Praxis.) K. Biehl.
90 Roentgenoscopy of the Spine. (Der röntgenologische Nachweis von Verletzungen der Wirbelsäule.) R. Graessner.
91 *Operative Treatment of Congenital Stenosis of the Pylorus. C. Rammstedt.
92 Palpation of Gastro-Intestinal Tract. (Die topographische Gleit- und Tiefenpalpation und ihre klinische Bedeutung.) Hausmann.
93 Experimental Syphilis in Rabbits. (Kaninchenimpfung mit Syphilitikerblut und Blutserum.) Aumann.

91. **Operative Treatment of Congenital Stenosis of the Pylorus.**—Rammstedt reports the successful application in two cases of Weber's technic for a partial plastic operation on the pylorus without opening the mucosa. Both patients were young male infants and the results were highly satisfactory. The serosa and the thick muscular ring are incised without disturbing the mucosa; the muscular ring gapes at once afterward, sufficient to correct the tendency to stenosis. The muscular ring was found closely contracted, bloodless, and, once divided, it separated, widening the lumen sufficient for the desired purpose. To make sure of this, however, Rammstedt sutured the incision in the first case, drawing the lips transverse, and suturing a wisp of omentum over the whole to protect the line of suture beneath. The child vomited occasionally afterward and was a long time in convalescing. In future Rammstedt intends to refrain from the transverse suture, being convinced that the slitting of the muscular ring answers the purpose fully. This corrects the spasmodic contracture of the pylorus; the hypertrophy will not cause disturbance if the spasm is corrected. This is rendered certain by the finding of a hypertrophied pylorus in children who have recovered from early stenosis of the pylorus and have died of intercurrent disease. If the slit pylorus is left a little incontinent, this can be regarded as an advantage rather than the reverse. He treated the other male infant in this way more recently, merely slitting the muscular ring of the pylorus below the mucosa, not attempting any suture afterward, and the results were perfect. The infant was completely relieved of all disturbances and never vomited after the operation but rapidly recuperated under appropriate dieting. As the duodenum is atrophied in these cases from disuse and is not accustomed to receiving much chyme at a time, it must be gradually trained to this after the operation. For these reasons, and the injury from the inanition, it is best not to defer the operation too long.

Monatsschrift für Geburtshülfe und Gynäkologie, Berlin

October, XXXVI, No. 4, pp. 393-510

94 Internal Secretion of the Corpus Luteum. Klutsi.
95 Papillomas of the Vagina. F. Klesselbach.
96 Mutation of Uterine Cancer. (Carcinosarcoma uteri mit Metaplasie des Zylinderepithelkarzinom in Plattenepithelkarzinom.) A. Stein.
97 Ovarian Cancer Inducing Lactation. (Ueber ein primäres und ein metastatisches Ovarialkarzinom mit Milchbildung in den Brustdrüsen.) H. Saenger.
98 Operative Treatment of Uterine Hemorrhage. E. Parker Davis (Philadelphia).
99 *Bacteriologic Control of Asepsis in Vaginal Celiotomies. D. von Ott.

99. **Asepsis in Vaginal Operations.**—Von Ott finds that in two-thirds of the gynecological cases in his clinic operative treatment can be applied by way of the vagina. By a series of experiments he has found that the vagina and cervix and even the uterine cavity can be completely sterilized with either mercuric chlorid or tincture of iodin. He urges a more extensive use of the vaginal in preference to the abdominal route on account of the safety offered by this possibility of thorough sterilization.

Monatsschrift für Kinderheilkunde, Leipsic

XI, No. 5, pp. 175-232

100 *Alkalized Kefir in Infant-Feeding. (Eine vereinfachte Methode der Behandlung akuter Ernährungsstörungen beim Säugling.) J. Peiser.
101 Delay in Vaccine Pustulization in Measles. (Verzögertes Auftreten von Impfpusteln bei Masern.) K. Neumark.
102 Two Cases of Patent Ductus Botalli. (Stauungslunge bei Offenbleiben des Ductus Botalli.) A. Hayashi.
103 Central Register of Women Willing to Nurse Another Infant Along with Their Own. (Eine neue Organisation für die Behandlung darmkranker Säuglinge.) Vogt.

100. **Alkalinized Kefir, a Simple Method of Treating Acute Digestive Disturbances in Infants.**—Peiser recommends the use of alkalinized kefir in treatment of acute intestinal troubles in infants. To half a liter of kefir he adds half a liter water and 5 c.c. of a 20 per cent. solution of sodium carbonate. The sugar content of the mixture is about 1.5 per cent.; albumin 1.0 per cent., and fat 1.7 per cent. It checks fermentation and brings about a normal condition of the stools. Its use should not be continued long after the stools return to normal, as it is not sufficient for the child's proper nourishment. It is easy to prepare, and it is cheap and therefore adapted for use in clinics. About twenty case histories are given, with the weight curves, to show the advantages of this food under certain conditions.

Münchener medizinische Wochenschrift

October 15, LIX, No. 42, pp. 2265-2320

104 *Diffuse Gonorrheal Peritonitis. H. Albrecht.
105 Action of Antistreptococcus Serums. F. Heimann.
106 Technic for Research on the Coagulation of the Blood. (Die Blutentnahme bei Gerinnungsuntersuchungen mittels der Methode von W. Schultz.) I. Holmgren.
107 *Technic for Intravenous Injection. Galli.
108 Thyroid Treatment of Sterility. (Schilddrüsenpräparate gegen Sterilität?) L. Weil.
109 Necropsy Findings in Case of Eventration of the Diaphragm. (Zwerchfellinsuffizienz.) H. v. Eggeling.
110 Origin, Prevention and Treatment of Nerve Relapses in Syphilis. (Erfahrungen mit Salvarsan. II.) G. L. Dreyfus. Commenced in No. 41.
111 Intoxication from Benzol Fumes. P. Beisele.

104. **Diffuse Gonorrheal Peritonitis.**—Albrecht gives the particulars of four cases of diffuse gonorrheal peritonitis; in two operative treatment was applied. In every case the peritonitis developed with a stormy onset, with rapid subsidence of the symptoms after the operation. The mild character of gonorrheal peritonitis is confirmed anew by these experiences.

107. **Intravenous Injections.**—Galli describes the technic which is in routine use at Baccelli's clinic at Rome as the Italians apply this method frequently in treating tetanus, sepsis, malaria, etc. The sphygmograph cuff is very convenient for the purpose; the radial pulse must not be abolished, only the systolic pressure. This permits the arterial blood to flow into the arm while the reflux in the vein is arrested. The syringe is filled to four-fifths with the fluid and the needle is inserted until it runs parallel to the course of the blood in the vein. Withdrawing the piston permits a little blood to enter the syringe if it is really in the vein. The contents of the syringe then are slowly injected and the piston is withdrawn a trifle again just as the pressure in the cuff is released. In his extensive experience with the method he has never witnessed the slightest untoward by-effects or pain from the injections.

St. Petersburger medizinische Zeitschrift

October 14, XXXVII, No. 19, pp. 277-291

112 Surgical Disease of the Pancreas. P. Bode.
113 Paratyphoid. (Zur Frage der Paratyphus-Erkrankungen.) S. Unterberger.

Virchows Archiv, Berlin

October, CCX, No. 1, pp. 1-160

114 Adaptation of Tissues. (Anpassungslehre, Histomechanik und Histochemie.) R. Thoma.
115 Scar Formation. (Aseptische und septische Narbenbildung.) E. Greggio.

116 Internal Pachymeningitis. (Umschriebene bindegewebige Verdickungen an der inneren Fläche der Dura mater bei Pachymeningitis haemorrhagica interna.) G. R. Lafora.
117 Protuberance on Anterior Margin of Optic Chiasm. (Fortsatzbildung am vorderen Rande des Chiasma nervorum opticorum.) S. Ogata.
118 Muscular Anomalies in Domestic Animals. (Dystrophie vereinzelter Muskeln beim Schweine und Pseudohypertrophia lipomatosa des Rindes.) L. E. MacKenzie.
119 *Iron in Muscles. (Auftreten mikrochemisch nachweisbaren Eisens und eisenhaltigen Pigments in quergestreiften Muskelfasern.) M. Ishida.
120 Obliterating Bronchiolitis. M. D. Karwicka.
121 Chronic Nodose Peribronchiolitis in Cattle. R. Hintze.
122 Morphology of Compensatory Hypertrophy and Hyperplasia of the Liver. K. Rochs and C. de Leeuw.

119. Iron in Muscle.—Ishida's material was that of sixty-one autopsies in addition to animal experimentation. In the cases where there was muscular atrophy, he was able to demonstrate michrochemically the presence of iron in the striated muscle fibers. This iron did not come from blood pigment but from the muscle itself, probably from the so-called muscle hemoglobin. In animals the same condition could be produced artificially by nerve section. The iron was more abundant in guinea-pigs than in mice. The practical value of this discovery is that we can no longer say that an iron-containing pigment is necessarily derived from the blood.

Wiener klinische Wochenschrift, Vienna

October 17, XXV, No. 42, pp. 1557-1592

123 Lipoids in Blood During Pregnancy and Their Elimination in Milk. (Lipoide der Gravidität und deren Ausscheidung nach vollendeter Schwangerschaft.) E. Hermann and J. Neumann.
124 Biologic Differential Diagnosis of Leprosy and Tuberkulosis. R. O. Stein.
125 Actinomycosis or Cancer of Submaxillary Salivary Gland. (Zur Kasuistik der Erkrankungen der Unterkieferspeichseldrüse.) O. M. Chiari.
126 Case of Oppenheim's Progressive Twisting Spasms. (Fall von Torsionskrampf.) S. Bernstein.
127 Fatal Sepsis from Bird-Shot Wound. (Zur Kasuistik der Schrotschussverletzungen.) J. Kumaris.

Zeitschrift für klinische Medizin, Berlin

LXXVI, Nos. 3-4, pp. 167-373. Last indexed Oct. 12, p. 1517

128 *Diagnostic Importance of Pepsin in Urine. (Harnpepsinbestimmung.) H. Tachau.
129 *Ultimate History of Syphilitic Families. (Schicksal Syphiliskranker und ihrer Familien.) M. Kaufmann-Wolf.
130 *Hemophilia. E. Gressot.
131 *Action of Large Doses of Alkalies in Diabetes. (Ueber einige Wirkungen grosser Dosen Natr. bicarb. bei Diabetes mellitus.) O. Hanssen.
132 Case of Paralysis Agitans with Enlargement of Parathyroid Glands. G. Gjestland.
133 *Intermittent Symptoms of Exophthalmic Goiter. (Ueber intermittierende Basedowsymptome — bei Tabes dorsalis und Bronchialasthma.) H. Curschmann.
134 *The Action of the Parathyroids in Nephritis. (Ueber die entgiftende Tätigkeit der Parathyreoidea bei der Nephritis.) M. Georgopulos.
135 Serodiagnosis of Echinococcus Disease. (Diagnostische Verwertung der Echinokokkenkomplementbindung.) T. Barsony and E. Egan.
136 *The Criteria of Healed Pulmonary Tuberculosis. (Die Kriterien der abgelaufenen Tuberkulose der Lungen und ihrer regionären Lymphdrüsen.) G. Goerdeler.

128. Pepsin in the Urine.—Tachau reports research which shows that the digestive ferments in the urine cannot be relied on as an index of stomach disease.

129. Syphilitic Families.—Wolf here reports a second series of nine women with syphilis in the Heidelberg clinic for mental disease, mostly with progressive paralysis. They were all married and some of their husbands remarried, so that the series includes twenty persons; only two were free from probable or certain syphilis. The series is a continuation of similar research on a group of forty-five persons (reviewed in THE JOURNAL, July 20, 1912, p. 236). Of the sixty-six pregnancies only thirty-three viable children were born, and fourteen died in childhood; three committed suicide at 12, 20 and 28; two were epileptics, and one died after an abdominal operation; thirteen are still living, but only two are normal. The others are all feeble-minded, epileptic, hysteric or with other nervous affections. This research was not undertaken to show the frequency of syphilitic nervous disease, but it demonstrates the great share which syphilis has in the development of nervous affections. The data presented show further that the assumption of a nervous predisposition is untenable, for the same parents in later years, after recovery from the syphilis, were able to generate healthy children. The first series showed that "occult syphilis" generally runs a comparatively mild course to the end. On the other hand, the second series show that the nervous form may prove an exceptionally serious taint for the family.

130. Hemophilia.—Gressot reports extremely minute clinical research for months in a case of hemophilia with necropsy two hours after death. The findings show that a general lack of thrombokinase cannot be the cause of hemophilia, but it is certainly lacking in the blood. It can be supplied from without in local application to the bleeding points in the form of fresh blood, serum or tissue juice. By this means the flowing blood can be rapidly coagulated and, provided that the thrombokinase can get deep enough into the wound, the hemorrhage may be arrested by it. This local application can be applied only to hemorrhage from the skin or mucosa of the mouth. No other means proved effectual in controlling the hemorrhages in the case described, although all the measures in vogue were given most thorough trial. There was no history of hemophilia in preceding generations, but the patient was the last of five brothers who had succumbed to bleeding from the gums or head after comparatively slight injury. The patient has five sisters, three of whom are married and are normal and their daughters are also normal, but each has lost one or two sons from hemophilia.

131. By-Effects of Sodium Bicarbonate in Large Doses in Diabetes.—Hanssen presents evidence to show that while the bicarbonate may arrest coma in diabetes mellitus, yet this effect is only temporary. The coma is merely postponed, and it is sure to return sooner or later. The alkali has also a pronounced effect on the weight, probably from the following retention of water. He tabulates fifteen cases in which the weight increased from 0.1 to 12.4 kilos (27.28 pounds) in from one to eleven days. The details of eight coma cases are also tabulated with the necropsy findings. Extreme hyperemia and edema in the meninges of the brain were found in every case, accompanied by hemorrhages in five cases. In three of the six cases in which the sodium bicarbonate had been given intravenously, clonic or tonic spasms followed. Albuminuria was a constant finding in all the severer cases of diabetes, but it regularly subsided under the alkali.

133. Intermittent Exophthalmic Goiter.—Curschmann calls attention to some cases in his practice in which the severe and complete picture of exophthalmic goiter developed at intervals, accompanied by other paroxysmal phenomena indicating disturbances in both the cerebrospinal and sympathetic nerve systems. He has found only one reference in the literature (H. Herz, 1902) to Basedow symptoms occurring intermittently in connection with vasomotor ataxia. His first patient had tabes, and during his severe gastric crises all the symptoms of exophthalmic goiter developed in a pronounced form, the exophthalmos, tachycardia, sweating and tremor, and the thyroid swelled. At first all these symptoms subsided with the gastric crisis without leaving a trace, but in time there was permanent persistence of slight exophthalmos and thyroid enlargement all the time, becoming exaggerated during the crises. In his two other cases the intermittent Basedow accompanied attacks of asthma. The exophthalmos, tachycardia, sweating and tremor were associated with various vasomotor symptoms, redness of the face and conjunctiva, cyanosis of the fingers, etc., and psychic disturbances, irritability, agitation, depression, etc., but the thyroid did not become enlarged. One of the men had symmetrical lipomas in his neck, and these swelled notably during the attacks but subsided again afterward, confirming the assumption of a connection between lipomas and thyroid functioning. The same injurious influence which induced the asthma and the thyroid intoxication, manifested in the intermittent Basedow, acted on the vasomotors of the lipomas. The essential primal cause seems to be thus some irritation of the nerves regulating the secretion of the thyroid. Curschmann's three cases of intermittent exophthalmic goiter throw light on the mechanism of the affection, and are further interesting from the therapeutic action displayed by epinephrin in regard to the tabetic crises. He found that three to ten drops of the 1:1,000 solution, by the mouth, arrested the crises much sooner and more effectually than morphin and sodium

nitrate. The epinephrin proved effectual also in arresting the asthma plus Basedow attacks in the other cases.

134. **The Parathyroids in Nephritis.**—In order to induce hyperfunctioning of the parathyroids, Georgopulos removed the thyroid in rabbits and then induced nephritis by injection of uranium nitrate. The results observed suggest that the parathyroids counteract the systemic intoxication in nephritis, and thus that an extract of these glands might prove useful in treatment of nephritis in man.

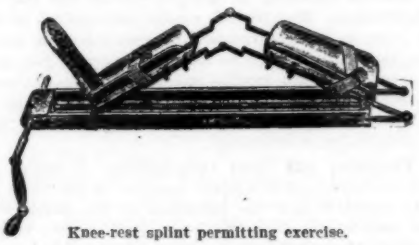
136. **Signs of Healed Tuberculosis.**—Goerdeler analyzes the necropsy findings in the lungs of persons known or suspected to have had tuberculous processes, and he devotes nearly one hundred pages and three colored plates to a discussion of the interpretation of the anatomic findings. In the same lung there may be induration of both tuberculous and non-tuberculous character and it is often extremely difficult to differentiate them. This difficulty renders it impossible to decide with any certainty as to the actual prevalence of pulmonary tuberculosis among adults. Many linear adhesions in the pleura and patches of induration in the apices have nothing to do with tuberculosis, and diffuse calcification and ossification are no criteria of tuberculosis. The statistics showing tuberculosis in 100 per cent. (Nägeli); 91 (Burkhardt); 80 (Harbitz), or 60 per cent. (Beitzke), of the cadavers examined should be corrected to percentages approximating Goerdeler's own, namely, 59.3 per cent. of 284 cadavers were certainly tuberculous, while 39 per cent. were probably or possibly tuberculous. The behavior of the elastic fibers and deposits of carbon are instructive differential points.

Zentralblatt für Chirurgie, Leipsic

October 26, XXXIX, No. 43, pp. 1473-1504

137 *Fracture of Patella. (Zur Nachbehandlung von Patellarfrakturen mit totaler Zerreissung des Streckapparates.) Gelinsky.
138 Tibia Flap for Gap in Skull. (Ersatz von Schädeldefekten aus der Tibia.) Kleinschmidt.

137. **Fracture of the Patella.**—Gelinsky refers in particular to fracture accompanied by total laceration of the extensor apparatus. The torn muscle retracts and shrivels and the longer this lasts the greater the force required to pull it out to unite the stumps again. The operation should follow the



Knee-rest splint permitting exercise.

injury as soon as possible, the next day at latest. Treatment should aim to suture the bone and muscles, relieve the traction on the sutures, and exercise the knee as soon as possible. These requirements he has met with an adjustable splint holding the knee slightly flexed; the flexion can be increased at will by forcing the heel nearer the hip by turning a crank screw. The screw thread is so fine that the heel can be moved part of a millimeter at a time. This permits gentle stretching of the muscle, stopping at the least sensation of overtraction. The muscle soon accustoms itself to the new position, the tension subsides, and after fifteen minutes the screw can be turned again and the muscle thus stretched a trifle more. At the close of the exercise the screw is wound the other way, bringing the heel back to its former position. This can be repeated several times and thus gradually the muscles can be flexed and stretched, keeping them in physiologic condition. He gives the details of three cases in which he applied this method with complete recovery. In one case carelessness resulted in the tearing through of the suture of the bone at the close of the first week. An apparatus was then applied, consisting of two claws fastened on each end of a rod with a screw thread. The claws were inserted in the outer edges of the patella and screwed together on the rod until they held the parts of the patella in close coaptation. In little more than a month the injured limb was ready to use at polo. The three cases illustrate the slight dependence that can be placed on the suture of the bone. The main thing is to restore normal conditions in the muscular apparatus. When this is done, if the parts of the patella separate later no harm results. The claw apparatus described can take the place most effectually of suture of the bone, and in future Gelinsky would not attempt the latter. Another advantage of the claw apparatus is that it does away with muscular traction on the suture. The claws can be left in place for three or four weeks. The tips are anchored in the tendons and do not enter the joint proper. An illustration is given also of this claw device.

Zentralblatt für Gynäkologie, Leipsic

October 26, XXXVI, No. 43, pp. 1417-1456

139 *Influence of Death of the Fetus on Eclampsia. (Bedeutungslosigkeit des Satzes von v. Winckel für die Lehre über die Eklampsie.) F. Lichtenstein.
140 Attempts at Abortion in Absence of Pregnancy. (Abtreibungsversuch bei fehlender Schwangerschaft, zugleich ein Beitrag zum Kampf gegen die kriminelle Fruchtabtreibung.) F. Thomä.

139. **Influence of Death of Fetus on Eclampsia.**—Lichtenstein states that in Lamsbach's recent exhaustive search through the literature he found records of only ten cases of eclampsia in which the convulsions ceased after the death of the fetus; in sixty-eight cases the convulsions developed first after the death of the fetus, and in sixty-six there was intercurrent eclampsia. These data disprove the assumption that the death of the fetus arrests the eclampsia. Fully 28 per cent. of the women died of the fifty who were delivered of a macerated fetus. When the patient begins to improve after the death of the fetus this is generally because the treatment has killed the fetus; this and the improvement observed are both the effects of a single cause—the therapeutic measures that have been applied. (Compare with article in THE JOURNAL, March 16, 1912, p. 781.)

Gazzetta degli Ospedali e delle Cliniche, Milan

October 15, XXXIII, No. 124, pp. 1297-1304

141 Agraphia. Dejerine.

October 17, No. 125, pp. 1305-1312

142 Radiotherapy as Adjuvant in Treatment of Surgical Tuberculosis. (La fototerapia come cura complementare invernale delle cure marine in alcune forme scrofulo tubercolari della cute e del sistema articolare e osseo.) E. Cortona.

October 20, No. 126, pp. 1313-1328

143 Operative Treatment of Primary Enlargement of the Spleen; Advantages of Ligation of Splenic Artery. T. Silvestri.

Policlinico, Rome

144 *Woody Phlegmon. (Caso di flemmone ligneo.) E. Guasoni.
145 *Reduction of Malaria in Italy. A. Celli.

October, Medical Section No. 10, pp. 431-478

146 Relations Between Anaphylaxis and Fever. C. Moreschi and A. Golgi.
147 Glycogen in Liver and Blood in Cholera. M. Segale.
148 Attempts at Serodiagnosis and Serotherapy in Kala-Azar in Children. (Tentativi immunodiagnostici ed immunoterapeutici nella Leishmaniosi infantile.) A. Longo.
149 Epidemic of Small-Pox. (L'epidemia di vaiolo a Fondi.) D. A. Mazzoiani.
150 Cholera in Southern Italy During 1911. (L'epidemia colerica nelle Puglie—Anno 1911.) A. Gasbarrini.

145. **Reduction of Malaria in Italy.**—Celli presents the full data and statistics in regard to the practically gratuitous distribution of quinin by the government, and the efforts at eradication of malaria by other means and the fine results thus accomplished to date, as he reported them at the recent International Congress of Hygiene at Washington.

Brazil Medico, Rio de Janeiro

September 22, XXVI, No. 26, pp. 373-384

151 Diagnosis of Duodenal Ulcer. R. Vaz.
152 Neurasthenia. (O tratamento physio-dietetico da neurasthenia.) G. Armbrust.

Medicina Contemporanea, Lisbon

October 20, XXX, No. 42, pp. 329-336

152 *Asthma with Pulmonary Syphilis in Child; Recovery Under Specific Treatment. (Cas de pneumosyphilose asthmatiforme.) S. Teixeira.

153. **Pulmonary Syphilis.**—Teixeira states that syphilis of the lung usually simulates acute or chronic bronchopneumonia or pulmonary tuberculosis or sclerosis of the lung, or syphilis and tuberculosis may be associated. In a recent case he found a fifth form in which the symptoms seemed to be those of ordinary asthma. His patient applied for relief from the asthma which had come on two months before. The muscles of inspiration were contracted and tender, the sputum gray and thick. He assumed an idiopathic asthma and instituted the ordinary arsenic and belladonna treatment, but the patient returned five days later showing no benefit. He then displayed some varicose ulcers on the right leg which had been given local treatment for a year by different physicians without benefit. The sight of these two ulcers suggested the diagnosis of syphilis and under mercurial treatment the ulcers healed up in a month and with them the asthma disappeared, and there was nothing left of the former trouble except a slight bronchial catarrh. In another case of pulmonary syphilis a little girl of 7 presented symptoms of pulmonary tuberculosis. The prognosis was regarded as grave until the discovery of a syphilitic eye affection in the mother. Under specific treatment both mother and child were restored apparently to normal health. At present, five years later, the only trace of the child's pulmonary syphilis is a patch of sclerosis in the middle portion of the right lung; she has taken a course of specific and arsenic treatment every spring and fall during the interval since.

Norsk Magazin for Laegevidenskaben, Christiania

October, LXXIII, No. 10, pp. 1406-1556

154 Roentgenoscopy of the Stomach. (Om den normale og pathologiske ventrikel i Röntgenbilleder.) S. A. Heyerdahl.
155 *Fever After Delivery Is Not Always "Puerperal Fever." (Barselfebre og feber i barselsengen.) K. Brandt.
156 *Intoxication Syndromes. (Hypotetiske betragtninger over ætiologien av kostsygdommene, svangerskaps-intoxikationerne og endel andre intoxikationssygdomme.) G. Benestad.
157 *Cholelithiasis with Complications. (Komplicerte galdeveistilfælder.) O. Borchgrevink.

155. **Puerperal Fever and Fever in the Puerperium.**—Brandt states that the science of medicine has been passing in the last ten years through a "mask and glove period" from which it is now emerging. Masks and gloves have not proved effectual in warding off infection, and science is returning to the old conception of the *vis medicatrix naturae*, or, as we call it now, the resisting powers of the organism. He expatiates on the dangers of allowing the public to cherish its present belief that when there is fever in a maternity case the obstetrician or attendants are at fault. Even certain physicians now cherish this belief, and it is not only erroneous but it may lead to disastrous consequences. He presents an array of evidence to prove that fever in the puerperium is not necessarily puerperal fever. It may be the manifestation of a perforating gastric or duodenal ulcer, appendicitis, rupture of an old pus focus in the uterine adnexa, miliary tuberculosis, gonorrhea, infected extragenital thrombi or osteomyelitic focus. The open wounds in the genital organs may become infected from some infectious process in the tonsils, from a mastitis or otitis media, while actual puerperal fever can certainly develop from self-infection. The diagnosis of actual puerperal fever cannot be made with certainty without direct visual inspection of the internal genitals at necropsy or an operation. He gives the details of nine cases in which to the lay mind everything seemed to indicate puerperal infection, and yet this was absolutely not the case in most of them. He urges the necessity for great caution in certifying to a death from puerperal fever when there has been no internal examination by the physician or attendant. In the first case, during the puerperium there was subfebrile temperature and occasional coughing and an effusion developed in the right iliac fossa. The respiration suffered and the patient died the twenty-ninth day, three days after the death of the child. The temperature curve was not that of puerperal infection, and necropsy revealed an old left pulmonary tuberculous process, a right tuberculous salpingitis and miliary tuberculosis, and the child's lungs were full of tubercles. Without the necropsy the death would have been credited to puerperal fever without fail. In the second case the puerperium was normal but two weeks after the patient's return home, headache and high fever developed as the first signs of sepsis, fatal fourteen days later. Necropsy here showed the uterus in normal involution, with nothing pathologic in the adnexa or surrounding tissue. Absolutely no cause for the infection could be discovered except a small ulceration on one toe. If the temperature and pulse curves and the necropsy findings had not shown such a normal course, this would have been regarded as a tardy puerperal fever. In a third case the woman had had placenta prævia two years before and she had "caught cold" before the present childbirth. The temperature and pulse were normal after a slight rise the third day, ascribed to the mild coryza with herpes. Otherwise the puerperium was normal and the woman was out of doors after her return home. As she did not feel quite well, she called a physician who found nothing pathologic and merely advised repose. As she continued to feel badly she called another physician who found then fever and an effusion near the uterus, and the woman died a month after dismissal from the hospital. The physicians ascribed the death on the certificate to "puerperal fever of five weeks' duration." The husband instituted a suit for damages against the maternity, claiming that his wife had been dismissed while she had puerperal fever. The maternity curves showing the normal temperature disproved part of this allegation. There was no necropsy. In this as well as in all the other cases reported no internal examination had been made by physician or attendant. The most probable explanation of the case is that some pathologic process left from the old placenta prævia had flared up during the involution of the uterus after the patient was up and about, and parametritis had followed. This case emphasizes anew the necessity for examining the maternity records and the post-mortem findings before certifying to a death from puerperal fever. In some of the other cases an intercurrent appendicitis or flaring up of an old process was responsible for the clinical picture of the puerperal fever. In others the patients had inflammation of varicose veins in the legs before delivery, and the inflammation spread upward, entailing a three months' sickness. Brandt considered the advisability of ligating the varicose vein but did not do this; in future he would ligate at once in such a case, striving to prevent the upward spread of the process in the femoral vein. There is no question that many cases of embolism in the puerperium are due to old thrombophlebitis. The genital organs undergoing involution offer a point of lesser resistance, so that infection from any point in the body is liable to localize there and get the physician or midwife into trouble unless the profession combats the present prevailing idea that fever in the puerperium is due inevitably to some sin of commission or omission on the part of the obstetrician or attendant.

156. **Pregnancy and Other Intoxications.**—Benestad groups beriberi, scorbutus and eclampsia together as affections due to products absorbed from the intestines or the glands with an internal secretion or from the fetus. He theorizes to explain them all as the result of absorption of unfinished products. Under normal conditions the products are elaborated a little more fully and are not toxic. In pathologic conditions, these products are unfinished and represent intermediary products which have a decidedly toxic action when absorbed. The manifestations are mostly nervous phenomena, cramps, convulsions and kidney or cardiovascular symptoms and hemorrhages. The outcome as a rule is either death or complete restitution. In all this group, from the standpoint of both therapeutics and prophylaxis, the diet is of primal importance.

157. **Complicated Gall-Stone Cases.**—Borchgrevink reports a case of perforation of the gall-bladder with circumscribed peritonitis; another of ileus following perforation of the gall-bladder and a third case in which the common bile duct became occluded after cholecystectomy. He discusses the literature on this subject of operative loss of continuity of the common bile duct and means to remedy it.

Ugeskrift for Læger, Copenhagen

October 17, LXXIV, No. 42, pp. 1499-1560

158 Connection Between Internal Ear and Central Nervous System. (Barany's Lære om Forholdet mellem Vestibularapparat og Centralnervesystem.) P. T. Hald. Commenced in No. 41.